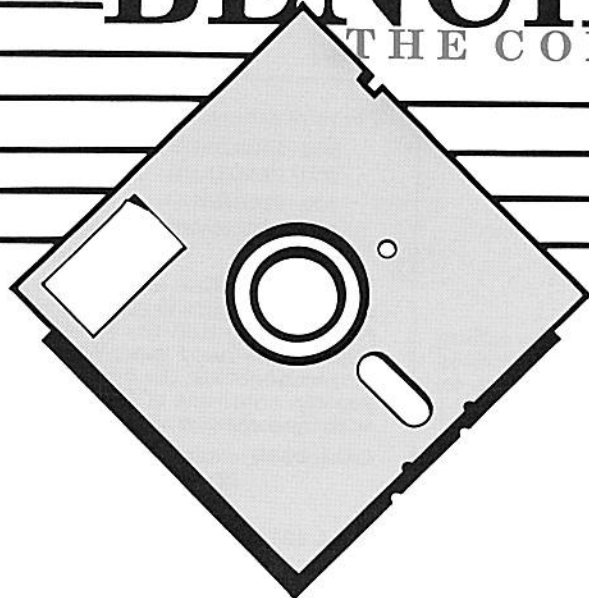


BENCHMARKS

THE COMPUTING CENTER



University of North Texas

VOLUME 11 NUMBER 3

APRIL/MAY 1990

THE DATABASE ISSUE



Varieties of Retrieval
Software (Page 2)
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SERVICES AVAILABLE TO USERS OF THE UNT COMPUTING FACILITIES

The UNT Computing Center is located in the Information Sciences Building (ISB), Room 119. Phone Numbers:

Computing Center: (817) 565-2324
Help Desk: (817) 565-4050
Micro Support: (817) 565-2316, 565-2319
Graphics Lab: (817) 565-3479
ISB I/O Area: (817) 565-3890
BA I/O Area: (817) 565-2350

All personnel listed below can be contacted either by calling the Computing Center or by sending them electronic mail on MUSIC/SP (ID-codes follow each name. All IDs are on BITNET node UNTMUSIC).

Benchmarks - Claudia Lynch (AS04)

Information & ID-Codes; Disk Space Problems - Theresa Russell

Statistical/Research Support - George Morrow (AS01), Panu Sittiwong (AC09), Phanit Laosirirat (AC44)

Academic ADABAS/COM-LETE - Staff

CRSP & COMPUSTAT Problems - Panu Sittiwong (AC09), Phanit Laosirirat (AC44)

Student Programming Problems - CSCI Dept., GAB Room 550; BCIS Dept., BARoom 152

Problems with JCL, Passwords, or Operating Systems; or Communication/Terminal Problems - Help Desk

Data Entry; Test Scoring & Analysis - Betty Grise

Administrative Applications - Coy Hoggard

Printout Retrieval - ISB or BA I/O Operators



DIALING-UP UNT COMPUTERS OVER THE TELEPHONE

Phone numbers for the Local Area Network (LAN) are:

300 - 2400 BAUD: (817) 565-3300
 300/1200 BAUD (817) 565-3499
 300 - 9600 BAUD: (817) 565-3461
 300 - 9600 BAUD: D/FW METRO 429-6006, 429-9314

Area code 214 must dial 817 before the METRO #.

The numbers that accommodate multiple baud rates have an autobaud feature that requires you to hit the <RETURN> key repeatedly so that the receiving modem can determine the appropriate baud rate. When you have established a communications link, the # prompt will appear on your screen and you can enter one of the following CALL commands to connect with the computer of your choice.

CALL 8040 connects with the NAS/8083 (supports line editing or PCWS). Operating environments available are: MUSIC/SP, VM/CMS.

CALL 3270 connects with the NAS/8083 through a 3270 protocol converter (supports full-screen editing). Operating environments are: MUSIC/SP, VM/CMS, ADABAS/COM-LETE, PHOENIX

CALL DEC connects with the VAXcluster (VMS, Eunice)

CALL 780 connects with the Research VAX (Unix)

CALL 3000 connects with the Libraries' HP-3000 (Bibliographic database).

CALL 6800 connects with the NBI (Unix)

Communications Settings

LAN addresses	Data Bits	Parity	Stop Bits
DEC, 3000	8	N	1
8040, 3270, 780, 6800	7	E	1

HOURS FOR UNIVERSITY OF NORTH TEXAS COMPUTER ACCESS AREAS : SPRING 1990*

Location	Days	Times
Computing Center RJE	Sunday Monday Tuesday-Saturday	Noon-Midnight 7 a.m.-Midnight 7 a.m., Tues.-Midnight Sat. (Open 24 hours/day)
ISB 110 Terminal Area	Sunday Monday-Thursday Friday Saturday	1 p.m.-Midnight 8:00 a.m.-Midnight 8:00 a.m.-9 p.m. 9 a.m.-9 p.m.
College of Business	Sunday Monday-Thursday Friday, Saturday	Noon-11:45 p.m. 8:15 a.m.-11:45 p.m. 8:15 a.m.-7:45 p.m.
GAB 550C	Sunday Monday-Thursday Friday Saturday	4 p.m.-Midnight 8 a.m.-Midnight 8 a.m.-5 p.m. 2 p.m.-8 p.m.
Graphics Lab	Sunday Monday-Thursday Friday Saturday	Noon-10 p.m. 8 a.m.-11 p.m. 8 a.m.-6 p.m. Noon-5 p.m.
Willis Library	Sunday Monday-Thursday Friday Saturday	1 p.m.-Midnight 7:30 a.m.-Midnight 7:30 a.m.-9 p.m. 9 a.m.-9 p.m.

*Hours may vary. Check MUSIC/VAX News and/or posted schedules for exceptions.

GENERAL INFORMATION

The Database Issue:

To Have or Not to Have, That is the Question

By Claudia Lynch, *Benchmarks* Editor (BITNET: AS04@UNTVM1)

Way back in 1976, when the first edition of the *Encyclopedia of Computer Science* (Van Nostrand Reinhold) was published, the definition for "data base" (note the separation of the words here) began with the statement "the term 'data base' has yet to achieve a widely accepted standard meaning." This is certainly not the case today. The words have united to become one and the concept of a database is considered fairly fundamental in computing circles. Granted, there may be discussions and differences of opinions about database architecture, but their *raison de 'etre* remains the same — to provide access to a large amount of information in a timely and efficient manner.

We are fortunate to have a variety of disciplines and viewpoints represented in this issue of *Benchmarks*. Norm Howden, of the School of Library and Information Sciences, starts things off with an article about various types of software used for information retrieval from databases.

Michael Holcomb, a graduate student in the Department of English, uses the Brown University Women Writers Project, written about in the September 1989 issue of *Benchmarks*, as a jumping-off point for an examination of literary databases.

Some databases available on the Internet are showcased in an article by Billy Barron, the VAX System Manager. An article by Eric Lipscomb, Assistant Network Manager for the School of Community Services and Kurt Grutzmacher, Microcomputer Support Consultant, talks about accessing databases available on various bulletin board systems.

Paul Schlieve, of the Department of Computer Education and Cognitive Systems, and Dave Molta, Director of Academic Computing, have contributed an article on database systems that are available for use on Novell Networks.

Finally, Marilyn Rice, a Microcomputer Support Consultant, and Kyle Capps, Manager of Microcomputer Support, have contributed articles about dBASE. Marilyn's article concerns the changes from dBASE III to dBASE IV, while Kyle's article, in the "Micro-Tips" column, involves using dBASE as the relational database system it was intended to be.

We hope that you enjoy this issue of *Benchmarks* and will continue to read our semi-monthly offerings. Some cosmetic changes are planned for our newsletter and should be apparent in the next issue. So, stay tuned for more exciting adventures in the world of computing — here at UNT and beyond. §

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Varieties of Retrieval Software

By Norman Howden, Assistant Professor, School of Library and Information Sciences
(BITNET: FE39@UNTVAX)

Software that stores and retrieves information is part of most computerized environments. Not everyone realizes, however, that serious differences exist between types of retrieval software. As with other software there is a diversity of types that fit different ecological niches, differing in types of data that can be handled, different processing functions, varied user interfaces, and varying degrees of functionality.

The three principal species of retrieval software are:

- Database management systems (DBMS's) that provide facilities for data entry, storage, retrieval to specification, and customized output. Usually DBMS's are programmable in a macro language.
- Information storage and retrieval systems (ISAR's) are typically those that allow data entry, heuristic search, and formatted output.
- Hypertext systems, the newest species, allow data input and storage by an author for retrieval and use by a client.

Each of these systems arrived on the scene with rather different historical antecedents. A more detailed functional comparison of these three types of retrieval systems is provided in the table at the end of this article.

Database Management Systems

DBMS's were developed for business users in large part in order to fulfill a goal of constructing enterprise-wide information systems. These software packages have the capability to maintain a multiple file database and provide functional access to only those fields in the data that a particular

user needs. Thus the accounting department programs may have access to name, address, and dependent data in the personnel file but not to annual evaluation data. A DBMS may index the fields of any file to provide access, but typically they only index the first dozen characters in the field. DBMS's support long text fields, but only in the most backhanded manner. Most, like dBASE, provide memo fields that can only be viewed - the program cannot search or manipulate the text. Most DBMS software is programmable by the user organization so that custom reports may be constructed and so that the DBMS may provide invisible support to software, such as an accounting program, that the end user deals with directly. Inquiries to DBMS's are usually very factual and

commercial vendors include DIALOG (a Lockheed subsidiary), Systems Development Corporation, Bibliographic Research Service, and LEXIS/NEXIS. Each developed search software that will support inquiry into very large files of several million random length records. Personal and local retrieval system users have been supported by mainframe programs such as FAMULUS which was developed by the U.S. Forest Service, STAIRS by IBM, and BASIS by Battelle Labs. The advent of microcomputing programs such as FYI 3000+, ZyIndex, Cuadra STAR, and INMAGIC, as well as programs downsized from the mainframe such as BRS Search, have facilitated searching on files stored on PCs. More recently some ISAR software has been put to use for accessing CD-ROMS. Unfortunately, far too many CD-ROM vendors have gone a cheap route with hastily contrived software that provides far from adequate retrieval speeds.

DBMS's support long text fields, but only in the most backhanded manner. . .

ISAR programs index every word in each field selected for indexing.

are directed toward retrieving information that is known to be in the database.

Information Storage and Retrieval Systems

ISAR's were originally in two environments. One vein of development was instituted to provide search access to centralized commercial files of bibliographic data. A second vein of development occurred to provide access to personal files of bibliographic data. The com-

ISAR programs index every word in each field selected for indexing. Access to the file normally provides the ability to specify the fields to be searched, allows truncation of search words (root word searching), and use of context (proximity) operators. Users enter queries phrased with Boolean operators (AND, OR, and NOT). Boolean operators may be nested as phrases (parenthesized) to any level and there is almost unlimited use of operators. Queries may be iterated and subsequent queries may include answer sets from queries entered previously during the search session. Users nor-

mally receive intermediate search results telling them the number of postings in the index file of each term entered during the search. When an output or print command is entered, the user normally has control over the format of the output and may select the specific records or ranges of records to include. Searches in ISAR software have a very fast response time for intermediate (postings) output. Users normally approach such a system to accomplish a "subject" search for items that may not be recorded. In a fair number of cases, such as when a researcher is doing background research before applying for a grant, the user may be quite happy that an exhaustive search yields no output.

Hypertext Systems

Hypertext systems are often misunderstood due to the HYPE generated by Apple Computer Corporation. The software for hypertext application was developed from three impetuses. One such influence stems from the government and large corporations who generate large textual databases from which output must be retrieved and analyzed. Within these masses of data there may be few or very irregular demarcations into sub-units such as chapters. Another influence comes from the need to distribute documents for use on newer high storage capacity microcomputer workstations. Finally, some hypertext was developed to access data stored on CD-ROMS. Software is thus very different, depending to a very large extent on the hardware upon which it runs. This is one software whose diversity also shows the clear evolutionary distinctions caused by the microcomputer revolution.

IBM PC based hypertext systems include Textbank/PC from Group L, Houdini from MaxThink, Guide by IBM, and KnowledgePro from Software Garden. These systems provide authoring capability so that

Hypertext systems are often misunderstood due to the HYPE generated by Apple Computer Corporation.

a producer may establish the links between points in the document and structure it to suit the data. Various licensing patterns exist and often there is a "run-time" module to insure that the software vendor receives a royalty fee. Each package may include the ability to display graphics with the text and KnowledgePro also provides an expert systems approach to data structured in its system.

Apple Hypercard, by contrast, is primarily an interface product. Where hypertext software is generally oriented toward accessing and manipulating large masses of text, Hypercard provides the capability to interface the user to other software, to programs written in its macro language, or to external resources via modem. By coincidence, the user interface contains tokens called "buttons" that may be overlaid on a text document to provide dynamic linking between words in different parts of the document. This is roughly the same sort of process used in dedicated microcomputer hypertext software. There are several distinctions though. Hypercard applications require a third party compiler to create a load module that will run as a standalone without Hypercard software. Hypertext applications provide other services besides linking, often including an indexing procedure much like an ISAR and facilities for analyzing the text. Without being unfair it would be useful to point out that Apple has the Macintosh hypertext market largely to itself and the HYPE approach to Hypercard is not serious competition with other hypertext software, but rather a problem felt most acutely in terminological discussions. At least one "true" hypertext program is made for the Macin-

tosh: Hypergate from Eastgate Systems.

Purchasing software to store and retrieve data is very clearly a process that demands planning and some analysis of the data to be handled. DBMS's are very good at working with data that consists of relatively short fields and whose output is primarily for known items searches with printed report output. ISAR's are primarily useful for large files of variable length records that must be searched quickly, conveniently, and heuristically. Hypertext systems are best used to access large quantities of free text and/or to distribute documents and access to them.

Conclusion

One issue that has recently come to the fore in the ISAR arena may affect other types of software in the future. Users of retrieval software found themselves inundated by ingenious vendors, each of whom has found a way to make their software interface unique. Operator burnout problems occurred from users having to learn numerous command languages. The American Standards Institute (ASI) is promulgating a new standard for "Common Command Language." Applied to retrieval systems, this standard will not require software developers to develop a uniform user interface, but when certain words are used they will have a relatively uniform meaning. For example, the word FIND must be used to enter a search statement while the word SHOW is to be used for displaying online the results of searches of the database(s).

Here at UNT many of us will be involved in projects that will require us to choose an information retrieval

software. If the project involves cataloging a reprint file, inventorying a personal book collection, or producing a definitive bibliography for a research project, an ISAR may well be the better tool. If you are contemplating a project and wish to see an ISAR or hypertext software before making a purchase you may certainly call me.

References

- Saffady, William. "Text Storage and Retrieval Systems: Part One and Part Two." *Library Computer Systems and Equipment Review* 10(2) & 11(1).
 Special Issue: Hypertext. *Communications of the ACM*. 31(7), July 1988.
 In Depth articles. *Byte*. October 1988.
 Feature stories. "The Changing Shape of Databases" *PC Magazine* 7(9), May 17, 1988. §

ISAR, DBMS and Hypertext Comparisons

Species Comparison	ISAR	DBMS	HYPERTEXT
Index File Structure	Inverted	Flat	Flat
User Access	Unlimited Boolean	Boolean	Links
Programmability	none	full	by author
Output	choice of options	very flexible	choice of options
Retrieval Speed	fast	slow	medium
Field Length	variable, long	variable, short	variable, no limit

Staff Activities

The following staff members have been busy writing and presenting papers recently.

- **Claudia Lynch**, *Benchmarks* Editor, co-authored a paper with Dr. Rosemary Killam of the College of Music. The paper, "Women Academic Musicians: Texas, New York, California," was presented at the South Central Women's Studies Association Conference held at TWU on March 30.
- **Phanit Laosirirat**, Academic Computing Services Statistical Consultant, co-authored a paper with Dr. Bob Bland of the Political Science Department. The paper, "A Pooled Time-Series Analysis of the Effect of Truth-in-Taxation on Property Tax Yields," was presented at the national conference of American Society of Public Administration in Los Angeles, April 8-11. §

Issues In Literary Research: Implications of Literary Databases*

By Michael Holcomb, Graduate Student, UNT Department of English

Elaine Brannan's article in last September's *Benchmarks* (1989) introduced the ambitious full-text literary database or textbase of the Women Writers Project at Brown University to the UNT academic community. It is reasonable to assume that present computer technology would make the compilation of a literary textbase a simple matter. After all, the computerization of a university library catalog is a familiar use of a database system; the speed and accuracy of a computer search, whether for title, author or subject, demonstrate the capability of the technology.

However, the database (or textbase) of the Women Writers Project (WWP) is designed to contain not simply titles, but numerous, complete literary texts. This large textbase can provide scholars with unlimited access to complete, original sources: printed books and author's manuscripts, unpublished poems, hand-annotated texts, letters, diaries, sermons, prayers, and translations, all stored and accessed by computer.

The goal of this article is three-fold: (1) to demonstrate to all members of the university community, including those with little background in computing, how invaluable a textbase can be, especially when used for computer-aided literary

*Much of the material for this article is drawn from my paper, "Issues in Research: Capturing Revision and Process" that I am presenting at the Sixth Conference on Computers and Writing: Writing the Future, University of Texas, Austin, May 17-20, 1990.

studies, (2) to briefly review the methods, goals, and recent developments of the Women Writers Project that is restoring many neglected women writers to the canon, and (3) to demonstrate how the WWP's textbase contributes to a synthesis between computing specialists and traditional literary scholars.

The potential of the WWP's textbase is exciting because it can organize and keep available a vast quantity of material. Scholars from different universities can contribute to the building of the textbase — and download material from it — through BITNET, the world-wide electronic network, accessible through the UNT computer systems. A computer at Brown stores the accumulated texts, which may be analyzed in-place, with appropriate software, or down-loaded for study on a personal computer or conversion to print.

The WWP'S Goal: Recovery

Sponsored by the National Endowment for the Humanities, the Women Writers Project focuses on pre-Victorian women writers in English. The computer is essential for the compilation and analysis of the work of approximately 1000 women writers in English before 1830.

The goals of the project are outlined in Elaine Brennan's article, "Using the Computer to Right the Canon: The Brown Women Writers Project," first published in *Brown Online* (May 1989), reprinted in *Benchmarks* (September 1989). Brennan explains the difficulties faced by woman writers from the 16th to the 19th centuries: "the implicit assumption (was) that women should not write, but they did so anyway . . . A few women writers were published, but . . . were rarely reprinted after their deaths. Selections from these published authors were included in anthologies up through the mid-1850s, after which

they suddenly began disappearing from view . . . Many women wrote in forms that are no longer popular, such as prayers, sermons, and religious narratives, which many literary theorists have used as a reason to ignore their work. Other works have been dismissed because women authors used language differently from male authors, leading some critics to call them inferior. Although many women wrote novels before Daniel Defoe's *Robinson Crusoe*, the form was considered trivial and marginal until men began to use it. Even after the form was taken seriously, the many early novels by women were still ignored

The potential of the WWP's textbase is exciting because it can organize and keep available a vast quantity of material. Scholars from different universities can contribute to the building of the textbase — and download material from it — through BITNET . . . accessible through the UNT computer systems.

— *Robinson Crusoe* is still often cited as the first real novel in English."

Recovering Early American Women Writers

So far, the WWP has found works by about 130 American women writing before 1840 that include autobiographies, Indian captivity narratives, diaries and travel journals, letters, essays, polemics and oratory, histories and chronicles, slave narratives, poems, fictions, dramas, forms of journalism and works in mixed genres. The search for this material is difficult. Professor Pattie Cowell, in the anthology *Women Poets in Pre-Revolutionary America 1650-1775*, includes a large amount of anonymous poetry that was located 'by the laborious process of leafing through entire issues of colonial publications' (quoted in the *WWP Newsletter*, Page 2).

British Recoveries

Margaret Ezell travelled in Britain in the fall of 1989 studying Scottish women writers in particular, including Lady Anne Wardlaw, Lady Grisell Baillie, and Alicia Rutherford Cockburn. Ezell found manuscripts of religious works and secular autobiographies by them and their contemporaries in the National Library of Scotland and the University of Edinburgh Manuscript Collections. Stuart Curran also worked in Britain last fall, studying Romantic women poets. He microfilmed and photocopied more than 50

volumes to be included in the WWP textbase. This virtually completes his project of "identifying and reading the over 500 women poets in Britain who published at least one volume of verse between 1770 and 1830." This semester, Curran's English poetry survey course includes as many women as it does men, which radically revises literary history.

What Are The WWP'S Challenges?

Telephone Interviews with Elaine Brennan provide information to update her "Righting the Cannon. . ." article; other information is from the *WWP Newsletter*, No. 1, Spring 1990.¹

¹To receive this newsletter, write: WWP Manager, Elaine Brennan, Box 1841, Brown University, Providence, RI 02912

... a large part of the task of creating a literary textbase is the systematic analysis of the material that is entered. A representational scheme must indicate extra-textual features because a text is more than a sequence of words.

Currently, the WWP is encountering two major sets of problems: 1) encoding issues, and 2) problems with software development. A brief review illustrates the challenge the WWP is facing. The encoding issue is critical because a large part of the task of creating a literary textbase is the systematic analysis of the material that is entered. A representational scheme must indicate extra-textual features because a text is more than a sequence of words. Just as word processing software uses control characters to indicate line spacing and page numbering, for example, a literary text has its control characters. Drama has stage directions, character names, acts, and scenes, in addition to the dialogue. Poems and essays contain introductions, titles, text breaks and notes. Whether a sentence occurs in a title, the body of text, or as a footnote, affects how that sentence is to be read. All the details of structure and content are essential to the literary scholar. A literary computer data base must contain indications of all important peripherals to the text as well as the text itself.

With printed texts, scholars can recognize extra-textual elements from their placement on the page. But as text is entered into the data base, its accompanying components must be systematically identified and their identity maintained so they can be subsequently retrieved, still correctly identified. Most of the WWP's encoding practices are based on traditional literary classification and analysis. But for the types of computer-assisted research the WWP envisions, Brennan reports, "it is necessary not only to standardize the terminology of literary research, but

to make refinements and extensions to the traditional theory." Initially, the WWP is using markup tags for text components that conform to SGML (The Standard Generalized Markup Language), a common markup standard. Since the WWP textbase will be independent of any specific application software, scholars will not have to struggle with problems of file format incompatibility.

New problems have been created, however, by the inclusion of texts with unusual features, for which a representation has not been standardized. For example, older texts exist in manuscript or in hard-to-read typefaces including a typeface

texts selected can easily be modified for printing in any desired format. For example, a book of poetry for the general reader will omit scholarly information such as variant lines from different editions; it will have misspellings or archaic spellings corrected and typographical errors omitted. Rules of format for a particular edition can be applied to a text's components to prepare it for a certain edition using the DBMS, if the text is carefully analyzed, when it is first entered. For example, all titles can be centered, enlarged and italicized since all were identified with a "title" tag. Additionally, the DBMS will facilitate, according to Brennan (*Benchmarks*, September 1989, page 23) "literary research such as stylistic studies, concordances, metrical analysis, and content and semantic studies in a way that is far superior to unstructured databases."

Further, this textbase will be able to handle queries and will be incorporated into large hypertext systems for instruction or research. Brennan

... some of the texts the WWP already has on-line are being incorporated into George Landow's Context32 application of Intermedia, a hypermedia teaching tool being used in English courses at Brown [University].

known as "black letter," common during the handpress period. Producing a printout, readable by the modern reader, is important in recovering these previously inaccessible works. Each of the countless variations encountered must be described or ignored.

Software development by the WWP is nearly complete, but there are still problems. Any text from the data base may be chosen for publication, using the controlling database management system (DBMS); those

(*Benchmarks*, September 1989, page 23) reports that "some of the texts the WWP already has on-line are being incorporated into George Landow's *Context32* application of *Intermedia*, a hypermedia teaching tool being used in English courses at Brown." Landow reports on his work in his article "Hypertext in Literary Education, Criticism, and Scholarship," (*Computing in the Humanities*, 23 [1988] 173-198).

The development of software to accomplish all this presents many

problems. Most databases are set up for fixed field. The WWP insists on their data base existing as a variable field. Information must be in retrievable chunks. Poetry can be contained in the data base as individual lines, but this will not work for a novel. Currently, states Brennan, there are problems with the searching software. Machines following coded instructions find it difficult to solve natural language problems. They cannot think like a human being. Machines can easily list words, and the number of times they occur to construct a concordance, but a machine still thinks a blind Venetian and a venetian blind are the same thing.

These encoding and software problems have delayed the completion of this ambitious system. Originally, the WWP planned to have the complete database system operational by the beginning of this year, but they have had to extend their completion date to the end of this year. Clearly, the WWP cannot stop their work until some future date when technological obstacles no longer exist because only by constructing this database can these

software and encoding problems be surmounted.

Flexibility is another requirement. The WWP textbase, governed by the Database Management System, will remain unaltered by specialized processing such as on-demand printing, stylistic research or hypertext use. Equally striking, this database is being constructed without tailoring it to suit any specific scholarly need or relying on a particular software or hardware. As a result, the WWP can use future technological developments without losing their investment in analysis and coding. The object is to support all scholarship without limiting it or prejudicing it.

Inherent in the concept of this project are the techniques for cooperation being devised. Brennan (*Benchmarks*, September 1989, page 24) reports: "The editorial state of every document in the data base must be carefully monitored and documented throughout the project," so the WWP is "evolving mechanisms for communication and decision-making within the group, for reliable documented back-up, and for project management."

What Are Implications Of The WWP's Work?

The work of the Women Writer's Project should go far to counter the prejudice that computer literary research suffers, a rejection that Rosanne G. Potter writes about, in her 1988 *Computing in the Humanities* article (page 91), "Literary Criticism and Literary Computing: the Difficulties of a Synthesis." Potter points out that literary critics are divided in their assessment of computer-assisted criticism: on the one hand, most present-day literary critics don't consider computers useful for studying literary texts; on the other hand, most literary computer analysts focus so much on technology that they neglect their goal of insight into literary texts.

I believe the synthesis Potter wants — between those skeptical that computers can aid literary research and those concerned only with technological aspects — will result from the combination of analysis and technology by projects like the WWP. Their textbase addresses one major stumbling block for computer-aided criticism: as Potter states (*Computing in the Humanities*, 1988, page 93), "the most practical impediment to the application of high-level computer methods to literary texts (is) the lack of a truly easy method of text entry." The WWP provides a solution: texts online.

Potter (*Computing in the Humanities*, 1988, page 93) speaks for synthesis to those skeptical of computing: "to all... types of critical discourse, what literary computing offers is evidence, precision of measurement, and universally-accepted standards of validity." To explain the trend toward specialization, she notes that it is normal for specialists to write primarily for others in their own field. Further (*Computing in the Humanities*, 1988, page 94), as their work becomes more specialized, they tend to move into "linguistics,

Semester Break Hours

Location	Dates	Times
Computing Center RJE	May 11 - June 3	Regular Hours
ISB 110 Terminal Area	May 11 May 14-18, May 21-25, May 28-June 1 June 2 June 3	7:30 a.m.-6 p.m. 8 a.m.-5 p.m. 9 a.m.-6 p.m. 2-10 p.m.
College of Business	March 9 March 12-March 16 March 17 March 18	8 a.m.-4 p.m. 10 a.m.-6 p.m. 8 a.m.-8 p.m. Noon-Midnight
GAB 550C	May 11	8 a.m. - 5 p.m.
Graphics Lab	May 11-June 3	To Be Announced
Willis Library	May 11 May 12, June 2 May 14-18, May 21-25, May 28-June 1 June 3	7:30 a.m.-6 p.m. 9 a.m.-6 p.m. 8 a.m.-5 p.m. 2-10 p.m.

Resume Regular Hours Monday, June 4

Areas are CLOSED on dates not listed.

... what literary computing offers is evidence, precision of measurement, and universally-accepted standards of validity.

natural-language processing, or database design ... decamping entirely from the field of literary criticism."

As one example of the difficulty of synthesis between the needs of the scholar and the demands of the computer world, Potter points to the encoding issue. Preparing texts for analysis in a PC by her program *COMP STYLE*, she observes (*Computing in the Humanities*, 1988, page 95): "First, line-length restrictions ... necessitate the segmentation of the text." Markers must be added, she notes, and "indifferent" details ignored if they will be disregarded by the computer. "Thus," she laments, "before we even start to use the computer's power to categorize the text, we have modified the text to suit our needs."

Potter (*Computing in the Humanities*, 1988, page 96) cautions about focusing only on technology, warning, "the literary critic turned computer text analyst may be overwhelmed by the quantity of data collected." Calling for moderation, Potter (*Computing in the Humanities*, 1988, page 97) maintains that we should use "computational methods for as long as they are relevant. ... (since) the world of literature is full of ambiguities, of categories that are not mutually exclusive, and of conclusions that are inclusive rather than exclusive." The Dutch scholar W. van Peer agrees (*Computing in the Humanities*, 1989, page 306): "The present situation, in which sophisticated concordances and analyses that one could only dream of twenty years ago, are now available even to students at the touch of a button, requires a keen sense of the relevance of the data generated."

Other Voices Speak About Computer Literary Research

Paula R. Feldman and Buford Norman, in their 228-page practical handbook, *The Wordworthy Computer* (1987), make clear how useful the computer has become for a literary researcher. This book, indispensable for anyone unfamiliar with computer techniques, thoroughly discusses the computer's abilities to compare different texts, list the variants, point to relationships between texts, handle notes and bibliographic references, send and receive messages, and prepare manuscripts for printing. Agreeing with Potter, they state that the computer cannot replace the scholar, but they stress that it can rapidly do certain analytical tasks that would take years by hand — and it can even suggest additional questions. They also include an 896-entry bibliography, a

in front of it; foreign phrases must be separated from the text because the computer can't distinguish between two languages. Both tedious practices allow the possibility for human error. Other data bases discussed include Grolier's *Academic American Encyclopedia*, now available in CD-ROM. Linda W. Helgeson discusses CD-ROM in her 1988 *Computing in the Humanities* article, "CD-ROM and Scholarly Research in the Humanities." Another CD-ROM database example is provided by the Tandy Corporation, currently marketing the *Encyclopedia Britannica* in that format through Radio Shack.

Feldman and Norman focus on methodologies for concordances, interpreting data, and stylistic analysis of texts, giving numerous examples. Concordances, indexes of each occurrence of every word or word component in a text, are useful because a textual passage can be located from a single word; the various ways a word is used can be studied, since all occurrences will be listed; the frequency occurrence of a word can point to a thematic group; formal structure, word play, different meanings and implications can be examined; variant editions can be compared; and vocabulary and imagery of poetry can be examined.

Once possessing data, the researcher needs statistical means of interpreting it ...

list of selected journals and periodicals and sources of information.

They emphasize the significance of data base technology, pointing to the successful full-text database of William Blake's work at the University of Iowa, and others, such as the *MLA Bibliography*. They also note problems inherent in encoding: for a computer to identify proper nouns, a marker (\$ or #) is usually placed

Once possessing data, the researcher needs statistical means of interpreting it; otherwise, the data may be overwhelming, as Potter and van Peer point out. Examples of authorship studies (*The Wordworthy Computer*, 1987) examine "wordprints," based on word and sentence repetition and length as well as frequency of occurrence of parts of speech to determine disputed authorship. Again, they emphasize that using

A brief look at the history of data base technology can be instructive for current developers.

statistical procedures on a text can be helpful, but only if the scholar is in firm control of the study.

A brief look at the history of data base technology can be instructive for current developers. *Computers in Humanistic Research* (1967) contains the papers from 1964 and 1965 concerning the role of the computer in humanistic research; the papers are interdisciplinary, primarily philosophical, and are useful because they deal with social and political implications of databases that still concern us today. More technical, *The Computer and Literary Studies* (1981) contains papers of the "Second Symposium on the Uses of Computers in Literary Research," University of Edinburgh, March 27-30, 1972. The twenty-six papers include linguistic and stylistic studies and studies of software.

Ben R. Schneider offers a report on the input problems of the *London Stage* database project. Schneider makes clear how difficult it can be to encode and enter textual data. Begun about 1971, *London Stage* is a compilation of all details known about stage performances in London from the Restoration to 1800, including all cast names of each performance, 21 million characters of information in all. To build this concordance at that time, typed copy was read by an optical scanner, although a suitable one was hard to find. After much searching, Schneider found one that could handle both parentheses and brackets, single and double quotes, and distinguish the number one from small i. But this scanner confused the zero and the large O. Schneider had to physically modify the capital O, destroying only one of his eight Selectric balls, fortunately. Then the scanner read a quotation mark as two apostrophes, occupying two

spaces. A change to the input program induced the scanner to read any two adjacent apostrophes as a quotation, which worked fine until the scanner came to an apostrophe followed by a quotation. Persevering, Schneider finally saw the eleven volumes of *London Stage 1660-1800* published, and later wrote an entertaining book on the experience, *Travels in Computerland. Computing in the Humanities* is another interdisciplinary collection of computer stylistic analyses.

Social Implications

At present, database technology is being developed further, by projects like the WWP. Discussing social implications, Karen Wright begins her March 1990 article "The Road to the Global Village," in *Scientific American*, by quoting Marshall McLuhan: "...after more than a century of electric technology, we have extended our central nervous system itself in a global embrace. . . ."

Posing crucial questions, Wright addresses three controversial issues arising from database/communications technology. First, who is to decide on compensation and on what basis? Is information property? Information is not destroyed when it is consumed. How can its value be defined? Another consideration is First Amendment protection. If all information is to be interconnected, a government could attempt to exercise control over material as it is disseminated. The third is the possible subversive effect consumers could have on the present system that markets art, literature and music as commodities. Wright observes (*Scientific American*, March 1990, page 94): "With high-speed networks and multimedia interfaces in place, Kapor and other observers suggest, writers could disseminate their work without publishers, composers and musicians could have an audience without signing a recording contract and anyone with a video camera could produce and distribute a sitcom." Is de-commodification liberating or counter-productive?

Social implications aside, the WWP's textbase, enormous in size and potential, can significantly affect future literary research—through the recovery of neglected

. . . after more than a century of electric technology, we have extended our central nervous system itself in a global embrace. . . .

Wright marvels at the new information technology, from systems for "speech processing, synthesis and recognition" to a multimedia hypertext "SuperBook," the aim of which is "to allow people in remote locations to interact with each other and with the same documents and files in a virtual space that could span feet or continents." (*Scientific American*, March 1990, page 91). These words also describe the WWP.

works and through the ability of the computer to process data so efficiently. Ideally, it will contribute to a synthesis between computing specialists and scholars of literature—and will not aggravate their division.

New database technologies, five or ten years from now, may bring about new or different solutions; but the work of the WWP in building this

database with current technology will help motivate the development of the next generation of systems, and pose questions for future projects to address.

In the March 1990 issue of *Benchmarks*, Dave Molta's feature article points out how indispensable the computer has become to the scholar; he shows that *connectivity* has become the major issue presently facing academic computing. The implication is, since the 1980s disbursed personal computers, the 1990s will connect them. The scholar's workstation is useful as far as goes: wordprocessing, automatic grade averaging, storing and manipulating data for small projects, all these all welcome features. But when the PC is connected to a network of computers and databases, then the computer's potential becomes unlimited. Connectivity has become a key issue: to access the WWP textbase, one must be linked to it. Thus, states Molta, the network will be the computer.

References

- Aitken, A. J., R. W. Bailey and N. Hamilton-Smith, editors. *The Computer and Literary Studies*. Edinburgh: Edinburgh UP, 1973.
- Bowles, Edmund A., ed. *Computers in Humanistic Research. Readings and Perspectives*. Englewood Cliffs, New Jersey: Prentice-Hall, 1967.
- Brennan, Elaine. Telephone interview. 6 Feb. 1990.
- . "Using the Computer to Right the Canon: The Brown Women Writers Project." *Brown Online*. Brown University Computing and Information Services. 2 (May 1989) 7-13; rpt in *Benchmarks*, Academic Computing Services, University of North Texas Computing Center. 10 (September 1989) 19-25.
- . *Women Writers Project Newsletter*, Providence: Project to Recover and Study Women Writing in English, c. 1330-1830. 1 (Spring 1990) 1-4.
- Feldman, Paula R. and Buford Norman. *The Wordworthy Computer. Classroom and Research Applications in Language and Research*. New York: Random House, 1987.
- Haar, Steven Vonder. "Tandy to Develop Encyclopedia on Disc." *The Dallas Times Herald*. Feb. 27, 1990, B2.
- Helgeson, Linda W. "Cd-ROM and Scholarly Research in the Humanities." *Computing in the Humanities*. 22 (1988) 111-116.
- Landow, George P. "Hypertext in Literary Criticism, and Scholarship." *Computing in the Humanities*. 23 (1989) 173-198.
- Molta, Dave. "Academic Computing in the 1990s: A Network of Scholars." *Benchmarks*. Academic Computer Services, University of North Texas Computing Center. 11 (March 1990) 1-4.
- Oakman, Robert L. *Computer Methods for Literary Research*. Columbia, South Carolina: University of South Carolina Press, 1980.
- Patton, Peter C. and Renee A. Holoien. *Computing in the Humanities*. Lexington, Massachusetts: Lexington-Books, 1981.
- Potter, Rosanne G. "Literary Criticism and Literary Computing: The Difficulties of a Synthesis." *Computing and the Humanities*. 23 (1988), 91-97.
- Schneider, B. R., Jr. "Analysis of a Data Base for Information Retrieval: The London Stage 1660-1800." *The Computer and Literary Studies*. Edited by A. J. Aitken, R. W. Bailey, and N. Hamilton-Smith. Edinburgh: Edinburgh UP, 1973. 275-282.
- . "Optical Scanning as a Method of Input." *The Computer and Literary Studies*. Edited by A. J. Aitken, R. W. Bailey, and N. Hamilton-Smith. Edinburgh: Edinburgh UP, 1973. 283-290.
- Schneider, Ben. *Travels in Computerland*. Reading, Mass.: Addison-Wesley, 1974.
- van Peer, W. "Quantitative Studies of Literature. A Critique and an Outlook." *Computing in the Humanities*. 23 (1989) 301-307.
- Wright, Karen. "The Road to the Global Village." *Scientific American*. 262 (March 1990) 83-94.

The Sixth Conference on Computers and Writing: "Writing the Future"

Thursday-Sunday, May 17-20, 1990, Austin, Texas.

Coming up soon is an important conference on computers and the humanities. Held at the Radisson Plaza Hotel in Austin, the third weekend in May, the sixth Conference on Computers and Writing brings together prominent researchers and teachers to discuss vital issues in computing and the humanities, including the teaching of writing. Conference highlights include keynote speeches by Michael Joyce, co-developer of *StorySpace*; Lester Faigley, author of "Subverting the Electronic Workbook," and Hugh Burns, author of *TOPOI*.

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- Interactive Fiction

For registration information, write: Computers and Writing Conference, University of Texas, Dept. of English, Austin, TX 78712 or send the one-line command GET WRITE90 CONF to LISTSERV@BITNIC.\$

VM Upgrade Planned

By Dr. Philip Baczewski, Academic Mainframe User Services Manager (BITNET: AC12@UNTVMI)

Barring unforeseen circumstances, the VM/SP operating system on the academic mainframe will be upgraded to VM/XA SP version 2.1 during the week of May 14, 1990 (semester break). Because of this change, the mainframe operating systems (CMS, MUSIC, MVS) may be unavailable for all of one day and all or part of another day during that week. Additionally, since it is projected that it may take as much as a week to stabilize the new operating system, the academic mainframe may need to be shut down and restarted on short notice at various times during that first week of the operation of the new VM system. During the first and possibly the second week of this upgrade, the mainframe will be in a "use at your own risk" status. We hope to have most or all of any problems worked out by the third week of the semester break.

VM/XA will eventually replace VM/SP entirely; however, during the first phase of this upgrade, the current VM/SP operating system will still be in place as the production VM system, running under the control of VM/XA. Between the second summer term and the fall, 1990 semester, the operating system will again be reconfigured, eliminating the VM/SP system. This means that for the summer terms, there will be no apparent change in the user environment for MUSIC, MVS, or CMS users. At the start of the fall semester, there may be a few changes for CMS users, since CMS itself will be upgraded from version 5 to version 5.5. MUSIC and MVS users should not be directly affected by this change.

This operating system upgrade is necessary to take full advantage of the capacity of the academic Hitachi Data Systems (HDS) model 8083. While the CPU has 32M

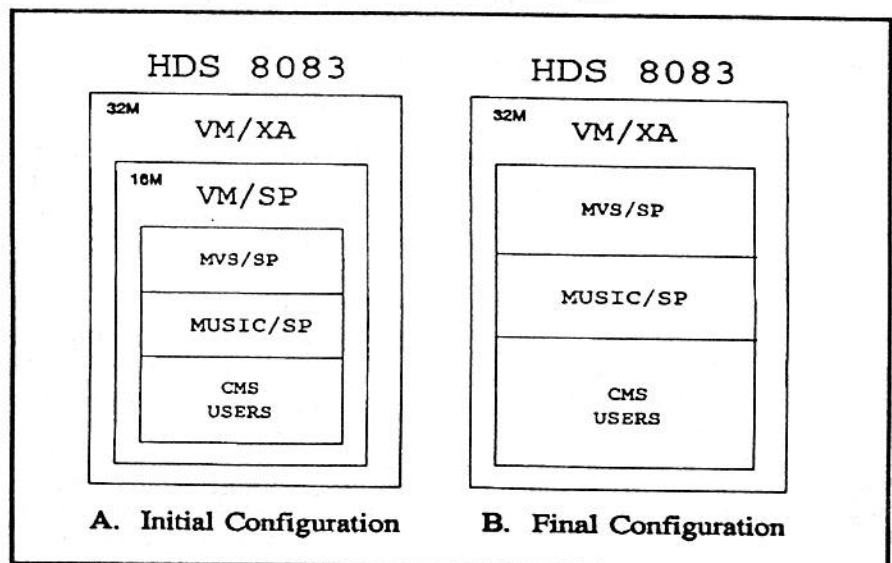
(megabytes) of storage installed, the VM/SP operating system can only use 16M. VM/XA can utilize all 32M of storage, allowing more memory to be allocated for CMS users and to the MVS operating system.

Currently, VM/SP is the primary operating system on the HDS 8083 mainframe. MUSIC/SP and MVS/SP (OS batch) run directly under its control as do CMS USERIDs. The initial stage of the upgrade, performed the week of May 14, will install VM/XA as the primary operating system. In order to maintain a consistent user environment while stabilizing and tuning the VM/XA system, the current VM/SP system will be run under control of the VM/XA system, as seen in Figure A, below. During the summer terms, plans will be made to run MUSIC and MVS directly under VM/XA. Software will be installed on the VM/XA CMS system to create a user environment comparable to the present CMS under VM/SP. The intended final configuration, scheduled to be put in production for

the fall semester, is shown in Figure B, below.

By taking advantage of the increased storage capacity supported by VM/XA, the UNT Computing Center can expand use of CMS to allow full general access. CMS is already in use by the BCIS department of the College of Business for their instructional purposes. CMS offers maximal BITNET communication support, an applications program development environment (ISPF/PDF), interactive compilers, interactive debugging environments (Fortran and COBOL), and interactive statistical programming (SAS and SAS/GRAPH). VM/XA should also provide additional storage for the MVS/SP system, thereby increasing the efficiency of that system as well.

As with any upgrade process, there is the potential for a period of system instability. The upgrade has been scheduled for the beginning of the break period after the spring semester in order to try to avoid any disruption during the summer terms. Once exact dates are scheduled for system down time, users will be notified on MUSIC NEWS and through HELP NEWS on CMS. If you have further questions concerning the upgrade, contact me at the Computing Center offices (ISB 119, ext. 2324).§



VM/XA Upgrade: Initial and Final Configurations

Did you ever call 6006 to find that . . . The Metro Line Sleeps Tonight?

By Kevin Mullet, Data Communication Analyst (BITNET: KEV@UNTVAX)

The Challenge

For many students at NT, access to the school's minicomputers or mainframe from home is not a high-tech nicety but a critical requirement for their studies. This is especially true for those students who commute from the Dallas/Ft. Worth area. For them, the metro dialup lines are a lifeline of communication with the computing tools required to complete their studies.

Many students hold down jobs and go to school simultaneously. For them, opportunities to complete computer homework frequently fail to fall into the times when computer labs are open. Many times, the Denton and metro dialup lines are the only way for these students to do the work required of them.

Accessing the school computers is sometimes more difficult for the user than the work they've been assigned to do on those computers. Frequent users of the metro lines encounter problems ranging from busy signals at times of peak usage to little or no response from a dialup line once their modem establishes a connection. NT students aren't alone in their dialup line frustration. Students at UT Dallas, UT Arlington and Southern Methodist University students all experience similar problems with their dialup facilities. Provision of dialup services is inherently difficult.

In addition to the existing challenge of local dialup service, NT employs a wide range of technologies to provide local service to Dallas and Ft. Worth users as well. Unfortunately, the metro dialup service is far from trouble-free.

The System

Many of the problems that plague the metro lines can be directly attributed to the complex combination of technologies that make up the metro line system (see page 17 for a diagram of the metro line configuration).

When a user calls either the 429-6006 or 429-9314 numbers, they are actually calling telephone modems at the Texas College of Osteopathic Medicine (TCOM). The RS-232¹ sides of those modems are all funneled into a statistical multiplexer. The multiplexer, or MUX, combines all the various signals that come into it and feeds them to a microwave transceiver. This TCOM transceiver ultimately communicates with a transceiver here at NT.

The microwave signal, once received at UNT, is divided into its constituent parts by a MUX like the one at TCOM. Then, the RS-232 signals that originated at the back of the

all the academic minicomputer and mainframe resources of the Sytek LAN available from their desktop. Unfortunately, everything does not always go well, least of all the weather.

Why It Fails

When all is not well and a metro line appears to fail, the problem could originate at any point from the host minicomputer or mainframe to the users' PC or terminal.

A frequent source of problems is the Agile or Sytek PCU in Denton. These problems are nothing new. In the early eighties, development of the campus-wide Sytek local area network began using Sytek PCUs to make NTSU's computing resources available to users nearly everywhere on campus. Sytek PCUs proved to be somewhat unreliable as they aged.

An alternative and compatible technology was found through the state's competitive bid process in units from Agile Systems, Inc. Agile's Agilenet Communication Units (ACUs) were used to supplement existing Sytek PCUs. Initially, the Agile ACUs performed well, but they also eventually developed problems. Agile techni-

Many of the problems that plague the metro lines can be directly attributed to the complex combination of technologies that make up the metro line system.

dialup modems at TCOM finally reach the Sytek 2502 Packet Communication Units (PCUs) in the GAB. Each PCU gives two metro line users access to the Sytek Local Area Network.

If all goes well, including the weather, the system works. D/FW users can place a local call and have

¹ RS-232 is a method of serial communications. Most external telephone modems use an RS-232 connection to attach them to a computer or terminal.

cal support was superior to Sytek's, though, and Agile worked with NT technicians to resolve these problems. Before the problems could be resolved, however, Sytek was purchased by Hughes Aircraft Co., and Agile was purchased by Sytek, which promptly terminated all support of Agile products. As of this writing, the availability of maintenance for Agile communication equipment on this campus is undefined.

UNT is dependent on an aging fleet of Agile and Sytek communications equipment, much of it almost ten years old. Nevertheless, a substantial majority of the Agile and Sytek equipment on campus continues to function adequately. It is, however, 1980 technology pressed into meeting the needs of a 1990 network serving over 24,500 students. In such an environment, every link becomes a critical link; every problem becomes an unacceptable event.

If, however, the Agile or Sytek equipment on a metro line is functional, then another likely place to find a problem would be the microwave link between NT and TCOM. The microwave transmissions from TCOM are sent to Texas Christian University. From TCU, the microwaves are beamed to The University of Texas at Arlington. From UTA, the microwaves are sent to The University of Texas at Dallas. From UTD the microwaves are finally sent to UNT.

All these convolutions are necessary for a couple of reasons. Microwave transmission must be done by line-of-sight. If there's an obstruction between two points, it's not feasible to communicate between them using microwaves. Between UNT and TCOM, a geographical structure called Keller Ridge prevents direct line-of-sight communication between the highest points at both campuses.

For that physical, and additional economic reasons, data communication between TCOM and UNT uses a pre-existing microwave network belonging to The Association for Higher Education (AHE). UNT, UTD, UTA, TCU and TCOM all use this network, and the most cost-effective

way to link all these institutions is in a point-to-point fashion from UNT to UTD to UTA to TCU to TCOM.

This means that all microwave communication between NT and TCOM is at the mercy of microwave equipment spread out on five different campuses. Maintenance of all this equipment is the responsibility of AHE, which works during normal working hours. Consequently, if there's a system-wide failure or a failure of just one of the microwave links at night or during a weekend NT must switch over to the backup

UNT is dependent on an aging fleet of Agile and Sytek communications equipment, much of it almost ten years old. Nevertheless, a substantial majority of the Agile and Sytek equipment on campus continues to function adequately. It is, however, 1980 technology pressed into meeting the needs of a 1990 network serving over 24,500 students. In such an environment, every link becomes a critical link; every problem becomes an unacceptable event.

systems.

There's one problem with that. Every system we use for data communication between TCOM and UNT over the microwave has a backup save one: the metro dialup lines. Although backup systems have been attempted, appropriate technology has not yet been found to provide adequate metro backup service. Consequently, when a microwave problem causes a failure of the metro lines, the only recourse D/FW users have is to absorb the cost of calling the Denton dialup lines long distance.

There's one potential source of microwave problems that no one has any control over, not even AHE: the weather. Communication using relatively low microwave frequencies resists failure due to weather

problems. Communication using relatively high microwave frequencies does not. Although the link from NT uses a frequency low enough to reach through normal Texas weather, the link between TCU and TCOM uses a frequency high enough to be severely affected by any significant rain or fog between the TCOM and TCU campuses. When the weather gets bad enough near a link, communication becomes impossible. When the link goes down, metro dialup service goes with it.

Clearly, the reliability of the metro dialup lines is directly related to the frequencies assigned to the various microwave links it uses. These frequencies are assigned to each "node" on the network by the FCC. The applicant usually doesn't have a great deal of control over the frequency (s)he is assigned.

Usually, however, the weather is good enough for the all links to operate. Under such circumstances, problems with the

metro dialups may sometimes originate with the actual modems installed in Ft. Worth at TCOM.

The modems attached to the metro dialup lines in TCOM are US Robotics Rackmount HST Modular Modem Boards. These boards are a rack-mounted equivalent to the standalone USR Courier HST 9600 baud modems in use by many people at NT. The standalone version of this modem delivers consistently reliable performance. The rackmounted version HST modem is a different story.

The rackmounted HST modem is nearly a complete redesign of the standalone version, although it serves the same functions. Apparently, the redesign did more harm than good. The rackmounted HSTs installed in the Denton 9600 baud lines

Anyone who calls into a dialup line and connects with the modem but doesn't get the "#" sign after hitting <RETURN> several times, should try hitting <CTRL><Q> a few times to re-enable transmission from that device. Most problems encountered with the dialup line can easily be solved with this trick.

were problematic from the very beginning. They ultimately required a custom tuning of each incoming phone line to meet the narrow and arbitrary tolerance levels for each modem.

The HST modems installed at TCOM have been a source of various problems with the metro dialups. Problems have ranged from not connecting to modems that didn't use MNP error control protocol or not answering incoming calls to abruptly hanging up on users in mid-session.

If a minor problem occurs with the metro lines, chances are only one or two lines on a given number are affected. Unfortunately, the failure of just one line associated with either metro number can prevent access to all the rest of the functional lines.

This happens because the 429-6006 and 429-9314 numbers are actually rotors. That means that for each rotor number, there are a complement of additional phone lines which serve it. When users call 6006, for instance, their phone call actually terminates at one of eight phone numbers dedicated to the 6006 phone number. Much the same is true for the other number: a call placed to 9314 terminates at one of three lines dedicated to that rotor.

This is, in fact, almost the same way the Denton dialups work with one critical exception. The Denton rotor service is provided by GTE while the TCOM rotor service is provided by Southwestern Bell. A call placed to a Denton GTE rotor will terminate at the *next* available line past the one that terminated the previous call. A call placed to a Southwestern Bell

metro rotor at TCOM will terminate at the *first* available line.

What this means to the user is that a problem with one metro line may render the remainder of available lines inaccessible from the rotor until the problem is fixed. If the first available line on a metro rotor is problematic, it will never be busy longer than it takes for a user to find out that it's inoperable. If it's rarely busy, then it may be the first available line for as long as it takes to fix the problem. If the problem doesn't occur during regular working hours, then it may not be fixed until the next working day.

On the Denton rotors, each successive call goes to a different line, rotating through the entire rotor, then starting over. With this kind of

What Can You Do?

The XOFF Problem

Frequently, users call a dialup line and get no response, not even a "#" sign. This is often due to various telecommunications software which engages in the practice of sending an XOFF instruction from the modem before hanging up. This means that each user who calls that same equipment will get no response until one of them sends an XON.

The solution to this is simple. Anyone who calls into a dialup line and connects with the modem but doesn't get the "#" sign after hitting <RETURN> several times, should try hitting <CTRL><Q> a few times to re-enable transmission from that device. Most problems encountered with the dialup line can easily be solved with this trick.

Reporting Problems

People who have problems with the dialup lines should call 565-2324 and ask to place a trouble call. Some people have previously expressed dissatisfaction with the quality of the

People who have problems with the dialup lines should call 565-2324 and ask to place a trouble call.

rotor, one bad line can be skipped by just hanging up and calling back. Unfortunately, this kind of rotor is unavailable in Fort Worth at TCOM.

From the Sytek PCUs to the actual telephone lines in TCOM, there is troublesome equipment and circumstances at almost every step of the way.

assistance they've received when calling the Computing Center after hours. They have tried alternate routes for getting support such as sending voluminous electronic mail to Computing Center staff members, leaving anonymous phone messages on their home answering machines or calling university administrators at home.

There are many reasons why these methods are inappropriate, but perhaps the best is that such "informal" trouble calls are undocumented.

In response to user input, the after-hours support system is undergoing an overhaul. In the near future, results of this overhaul should include better and more consistent response to people that call 2324 to place an off-hours trouble call.

When trouble calls are undocumented, they are likely to be forgotten shortly after the problem is resolved. If a reoccurring problem is left undocumented and forgotten, it is unlikely that a permanent solution will ever be sought.

What We Are Doing?

Trouble Calls

In response to user input, the after-hours support system is undergoing an overhaul. In the near future, results of this overhaul should include better and more consistent response to people that call 2324 to place an off-hours trouble call. There should be earlier and more reliable determination that a serious problem may exist that justifies calling in regular staff. Reporting, tracking and follow-up on all problems reported off hours should meet the same standards as those reported during the prime shift.

In addition to overhauling the trouble-call system, the Computing Center is now taking steps to solve each of the problems covered in this article. Some of the changes are the most sweeping changes to the NT computing community since installation was begun on the Sytek LAN almost a decade ago. One change in particular will bring high-quality, high-speed access to the resources of countless wide-area networks, including the international NSF-Internet, directly to the desktop of nearly every user on campus.

The Sytek LAN

The Agilenet 20 Communication Units through which metro line users accessed the Sytek LAN were excessively prone to failure. They have all been replaced with more functional Sytek 2502 "system 2000" units from the reserve of replacements. These units have the best track record of all the Agile and Sytek communication units used at NT.

Replacing a handful of PCUs does not address the larger issue of an aging and over-taxed Sytek local area network. The solution to this is being found in construction of a new high-speed backbone throughout campus. Over the next few years, a general migration will be made from the older 2 megabit-per-second

From any workstation on this network, a user will be able to directly log onto any computer in the world provided it is on the extensive NSF-Internet network and (s)he has a valid userid for that particular system. This will serve to stimulate the amount and diversity of research done at NT, reduce the distance between NT and every other major research institution, and provide practical citizenship for any NT student, staff or faculty member in the electronic "global village".

This campus-wide Ethernet should solve the long term problems posed by the Sytek LAN and its constituent communications equipment. To meet the intermediate issues of the current Sytek LAN, the Computing Center is seeking a maintenance source for existing Agile equipment.

The Microwave Link

Many solutions and alternatives have been examined to address the problems posed by the AHE microwave link between UNT and TCOM.

The most promising intermediate solution is to move the metro lines

Over the next few years, a general migration will be made from the older 2 megabit-per-second broadband backbone that provides the Sytek LAN service, to the newer 10.2 megabit-per-second campus-wide Ethernet.

broadband backbone that provides the Sytek LAN service, to the newer 10.2 megabit-per-second campus-wide Ethernet.

At a speed over five times that of the existing backbone, the new backbone will use fiber optic technology as a transport medium for a campus-wide Ethernet. This fiber-optic network will provide all the functionality of the current Sytek network with additional wide-area network benefits.

from Ft. Worth to Denton. Historically, this choice has been prohibitively expensive, but recent developments may make it somewhat more affordable. If fact, an item currently on the Public Utility Commission docket may even make the economics of Denton-based metro dialups quite attractive.

Another longer term solution being considered is to add metro dialup lines to the University of Texas at

By acting as a "human rotor," you can retain complete access to all the metro lines regardless of the rotors' response to one or two failed lines. Direct numbers used by the 429-6006 rotor are 429-6479, 429-6514, 429-6518, 429-7103, 429-7253, 429-7520, 654-3046, and 429-7630. The direct numbers used by the 429-9314 rotor are 429-9314, 429-9315, and 429-9316.

Arlington dialup rotors, and install the necessary equipment and software to provide metro dialup service through the Internet.

The Internet/UTA approach is more consistent with approaches taken by universities comparable to NT. The Denton metro line solution provides for less reliance on factors over which the Computing Center has no control, such as the UTA dialup lines, or various communication links used by the Internet.

Investigation to find the best way to provide metro dialup service continues. You may rest assured that throughout the decision-making process, your needs will be given paramount consideration.

The TCOM Rotors

The problem of providing a more appropriate rotor service to the existing rotors in TCOM seems insoluble. There is, however, a workaround solution that you can rely on: calling the actual metro lines directly.

Each number is still a local call within the metro area. If one num-

ber is busy or unresponsive, try the next one in the series. By acting as a "human rotor," you can retain complete access to all the metro lines regardless of the rotors' response to one or two failed lines. Direct numbers used by the 429-6006 rotor are 429-6479, 429-6514, 429-6518, 429-7103, 429-7253, 429-7520, 654-3046, and 429-7630. The direct numbers used by the 429-9314 rotor are 429-9314, 429-9315, and 429-9316.

Conclusion

Hopefully, the information in this article will help to alleviate some of the frustration the metro lines generate.

Historically, providing adequate metro dialup service to the majority of NT students who commute has proven to be a challenge. Fortunately, the Computing Center now has the technology and expertise to provide suitable dialup service for those users. The patience of the NT computing community will be well rewarded in the coming months. §

Kevin Mullet is a Data Communication Analyst in the Computing Technical Services division of the Computing Center. He may be reached via e-mail at KEV@UNTVAX.BITNET This article may be retrieved electronically on the VAXcluster or the Novell Internet as WP51 file: NTVAXB/dua1:\kev\articles\metro.103.

Classroom ID Codes Set to Expire

By Dr. Philip Baczewski, Academic Mainframe User Services Manager
(BITNET: AC12@UNTVMI)

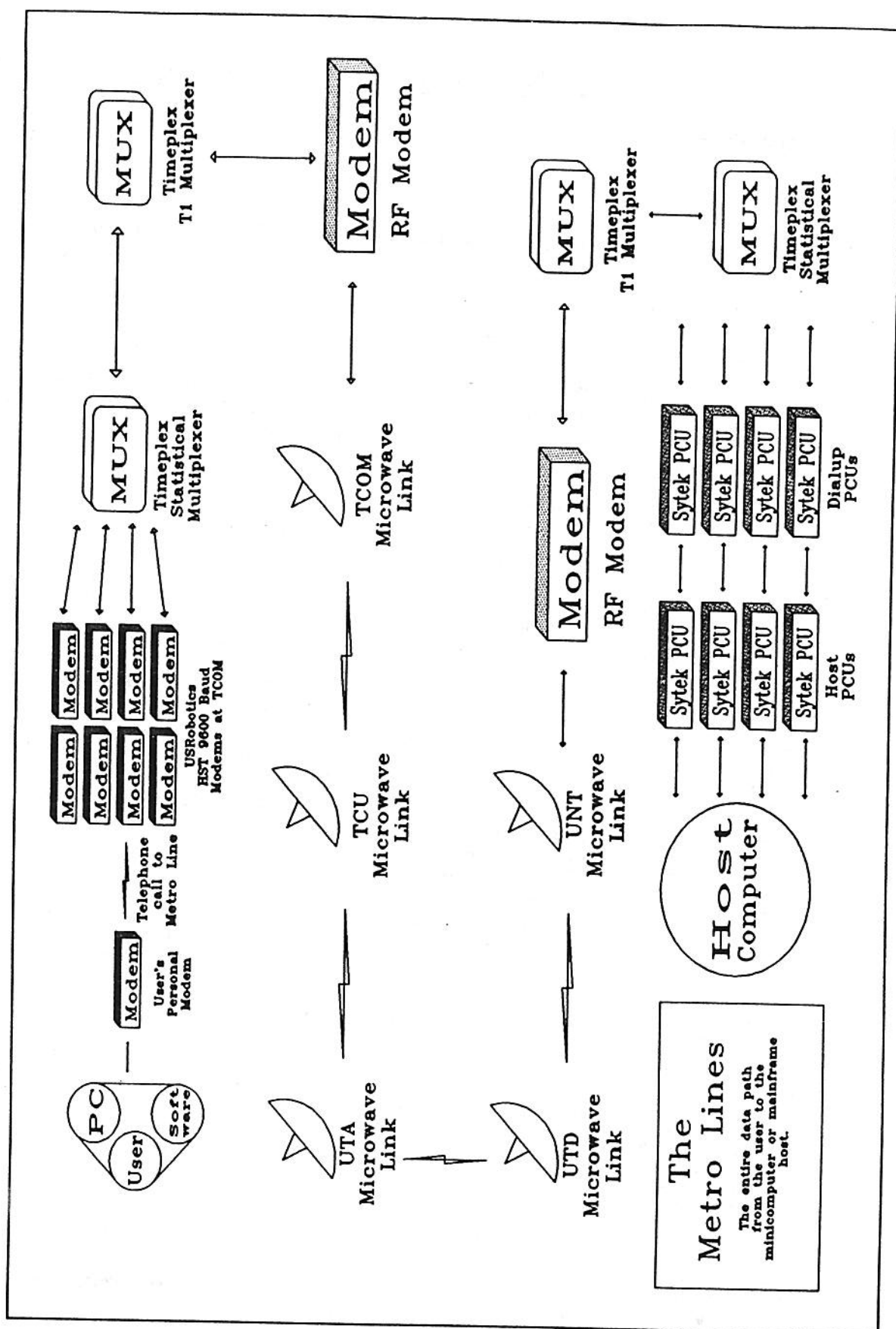
All MUSIC, CMS and VAX Class IDs (ID codes JA00 through RZ99) will expire on Friday, May 11, and all Class IDs and associated files will be purged from their respective systems on Monday, May 14. If you wish to access your files beyond this date, you must apply for an individual ID Code immediately, so that your files may be transferred. While we are happy to transfer your class files to an individual code before they are purged, restoration of files after they have been purged from the system are done on a low priority basis, as time allows. Note that because of the VM operating system upgrade to the academic mainframe, files cannot be restored to MUSIC or CMS until the beginning of the first Summer term.¹ If you need your files after May 11, make your request now for an individual ID-Code, and ask that your class files be transferred. Note that you will need your department chairperson's signature and a faculty member's signature for your request to be processed. NEW ID Code application forms may be obtained from the Computing Center offices (ISB 119).

¹ See *VM Upgrade Planned*, on page 11 of this issue. §

A Sign of the Times

The Great American Traditions: Baseball, The Flag, Apple Pie & E-MAIL!

Seen in the *Tropical Byte*, the University of Miami Information Resources Newsletter



Internet Databases

By Billy Barron, VAX System Manager
(BITNET: BILLY@UNTVAX)

The Internet is a collection of interconnected networks that span the world and it can be accessed through the VAXcluster or sometimes, through CMS Mail. Many databases containing information on a wide variety of topics are available to Internet users. Following are descriptions of some of these databases.

- **Bibliographical Databases** – Dozens of universities' library card catalogs are accessible through the Internet. The Computing Center has a handout available in ISB 119 on these library systems and how to access them.
- **GenBank** – GenBank is a database of Genetic information. It can be accessed by sending MAIL to GENBANK-SERVER@UHNIX2.UH.EDU. For more information, send a mail message that only contains the word HELP to that address.
- **Geographic Name Server** – The Geographic Name Server provides on-line information about known geographic locations. This information includes latitude, longitude, zip code, area code, population, and altitude. To access the Geographic Name Server, type TELNET MARTINI.EECS.UMICH.EDU 3000 on an Internet host. After logging in, just type HELP for instructions.
- **LIMB** – The LIMB (Listing of Molecular Biology databases) database is a collection of information on molecular biology databases. Requests for copies of LIMB can be sent to the E-mail address limb@lanl.gov. In your request, specify a format (hardcopy, floppy disk, or e-mail).
- **MEMDB** – (Medieval and Early Modern Data Bank) is attempting to provide scholars with reference materials on the time period 800-1800 AD. Information includes wages, prices, housing, mortality, property, charity, nutrition, etc. For more details on MEMDB, contact (201) 932-8335.
- **NBS Time** – The National Bureau of Standards offers a high precision time service over the Internet. It is possible to get time accurate to fractions of a second by the following command from an Internet host TELNET INDIA.COLORADO.EDU 13.5

THE BITNET CONNECTION

By Dr. Philip Baczewski, BITNET INFOREP (BITNET: AC12@UNTVMI)

This Column is a continuing feature of Benchmarks intended to present news and information on various aspects of the BITNET wide area network.

Files on Demand

The many installations of LISTSERV throughout the BITNET wide area network provide a key service by allowing numerous people at diverse institutions to communicate on topics of mutual interest. LISTSERV mailing lists continue to be a focal point for BITNET use.¹ One fact about LISTSERV installations which may not be readily evident is their file server capability. The ability to distribute files of information upon request is built into LISTSERV. This capability allows LISTSERV to extend its functionality beyond its primary duty of supporting network mailing lists.

The first step to finding out what files are available from a particular LISTSERV installation is to send it the INDEX command either via an interactive message or as the first line of a mail message. Using LISTSERV at UTARLVM1 as an example, a VAX user could use the command SEND LISTSERV@UTARLVM1 INDEX and a CMS user would use the command TELL LISTSERV AT UTARLVM1 INDEX. The LISTSERV would respond by sending a file called LISTSERV FILELIST (or LISTSERVFILELIST on the VAX). This file is usually a directory listing more filelists for various categories along with a short description of each of them. These filelists can be thought of as subdirectories which organize the files maintained on a LISTSERV into groups according to category.

Some filelists are common to all LISTSERVs. For example, INFO FILELIST lists files which contain documentation on using LISTSERV; TOOLS FILELIST shows network software utilities which are used by LISTSERV and which are made available to system managers at other BITNET nodes; CONTROL FILELIST lists some of the data files used by LISTSERV which might be useful a general user. Other filelists maintained, however, may vary from installation to installation and are very often related to the mailing lists maintained by that particular LISTSERV. Mailing list archives are often maintained on the LISTSERVs from which the list is moderated, and sometimes at its "peer" LISTSERVs.²

If you were interested in exploring the LISTSERV filelists, you could send an index command to every LISTSERV on BITNET, however, considering the number of LISTSERVs and the amount of network traffic generated by this approach an alternative strategy is recommended. One place to start looking is in the BITNET SERVERS file.³ It contains a section entitled "LISTSERV filelists" which high-

¹ For more information on LISTSERV, see "The BITNET Connection," in the May/June 1989 issue of *Benchmarks*.

² Some popular mailing lists are distributed from more than one LISTSERV installation, but moderated from one LISTSERV. LISTSERVs which maintain the same mailing lists are referred to as "peers."

³ This file is DUAL:[PUBLIC.NETWORKS.BITNET]BITNET.SERVERS on the VAX and is a public file called BITNET.SERVERS on MUSIC. A copy of this file is also available on CMS on the Academic Computing Services public disk. To access that minidisk use the commands: LINK ACAD 291 291 <RETURN> ACC 291 B <RETURN>

lights many of the filelists which may be of interest to BITNET users. Among these are: the CCNEWS FILELIST (an archive of contributed articles from computing newsletters) maintained at LISTSERV@BITNIC; TEX FILELIST (files related to the TeX public domain text processing system) at LISTSERV@TAMVM1; MAC-ARCH (a large archive of public domain and shareware programs for the Macintosh) at LISTSERV@RICE; POLYMERP (archives of the Polymer Physics LISTSERV mailing list and related files) at LISTSERV@RUTVM1.

Not all of the filelists mentioned in the BITNET SERVERS file will be of interest to all users, so the next step you might want to take in reviewing filelists is to send the INDEX command to LISTSERVs which maintain mailing lists on topics that interest you. Often these filelists are begun to serve the needs of the members of a particular LISTSERV mailing list. These filelists are often referred to in the course of those mail-based discussions. A good place to see the various mailing list topics is the file LISTSERV GROUPS.⁴

LISTSERV filelists are not necessarily a comprehensive source of on-line information, but rather supplementary information to the communication which ordinarily occurs via LISTSERV. Many specialized file servers are listed in the BITNET SERVERS file, and these collections are probably more comprehensive for their particular category than information found on LISTSERVs. LISTSERV filelists, however, can be quite handy place to look for information not found on the specialized file servers.

⁴ See the public file LISTSERV.GROUPS on MUSIC, DUAL:PUBLIC.NETWORKS. BITNET.LISTSERV LISTSERV.GROUPS on the VAX, and LISTSERV GROUPS on the ACAD 291 minidisk on CMS. §

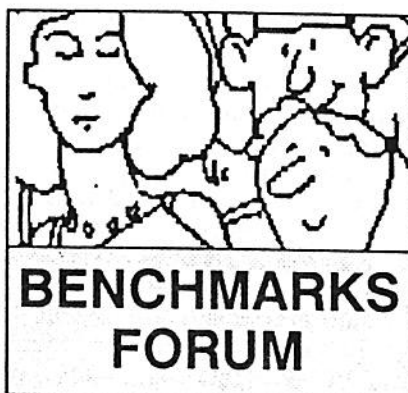
LIST of the Month

Each month we will highlight one of the BITNET LISTSERV Special Interest Group (SIG) mailing lists. This month's list...

PROCOM-L@ATSUVAX1 - Procomm User List

The PROCOM-L list is dedicated to discussion among users of the ProComm 2.4.2, 2.4.3, and ProComm Plus Terminal Emulators on PCs and PC clones. Subscribe by sending mail to MAILSERV@ATSUVAX1 with the message SUB PROCOM-L Your_full_name.

The UNT Computing Center maintains a site license to distribute Procomm, version 2.4.2, to faculty, staff, and students. If you are using Procomm as your primary PC communications package, this discussion list may provide some helpful information.



BENCHMARKS FORUM is intended to serve as a vehicle for answering questions that may be of general interest to the user community. If you have a question, please send electronic mail to the Benchmarks editor (BITNET:AS04@UNTVM1) or write it down and drop it by the Computing Center. We will try to answer it in the next issue.

Question: It appears that the VAX system is still being called a "cluster," even though we now have a single 6310 instead of the two 785s. Why is this?

Answer: It is still being called a cluster for two reasons.

1. Technically, it is still a cluster because:
 - a. We are still using the clustering equipment.
 - b. The disk drive controller (a special purpose PDP-11) actually counts as a cluster node.
2. Practically, we want to keep using the same terminology so that we do not have to change all the documentation. §

Benchmarks Reader/User feedback is encouraged. Send all letters, suggestions, etc to (AS04@UNTVM1), FAX 817-565-4060 or to the Benchmarks Editor at:

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MICROCOMPUTERS

Database Systems on Novell Networks

By Dr. Paul Schlieve, Department of Computer Education and Cognitive Systems
(BITNET:SCHLIEVE@UNTVAX) and Dave Molta, Director of Academic Computing Services
(BITNET:MOLTA@UNTVAX)

The following is an excerpt from Novell NetWare: Advanced Applications, by Paul L. Schlieve and David Molta, forthcoming from WordWare Publishing.

Introduction

There are three types of database systems that can potentially be used with a Novell network. There is no one, best solution. The most expensive solution may not give the greatest performance for a particular application. The options include a single-user database, a multi-user database, and a database server. Each has potential applications in a network environment.

The fundamental problem with allowing multiple users access to a database occurs when two users attempt to modify data at the same time. For example, assume that Mark Smith sends a change of address with his monthly payment. Customer service gets the change of address and accounts receivable gets the payment. Customer service selects the "Database Edit" function and types Mark's account number into the database system. The database retrieves Mark's account information and displays it on the screen. While Customer service works to type in the change of address information, Accounts Receivable also selects "Database Edit" and types Mark's account number into the system. Customer service finishes typing the change of address and instructs the database to perform the update. Next, Accounts Receivable finishes their posting of Mark's payment and updates the database. But wait! The copy of Mark's records on the Accounts Receivable computer contains Mark's old address. When the update takes place, Mark's old address replaces the Customer Service update of his new address. It's as if the change of address never took place.

There is more than one method to address the problem of simultaneous updates, and these methods are one of the major differences between single-user databases and multi-user databases. The sophistication of the methods available to prevent simultaneous updating of information is one of the criteria used in selecting one database system over another for network applications.

Single User Databases

A single user database can typically be loaded onto a file server and used successfully by a single user, or by multiple users under carefully controlled conditions. A single-user database has no provision to control for simultaneous access by multiple users. When only one person uses a database on a single machine, such features are not necessary.

There are times, however, when there are advantages to using a single-user database in a network environment. In general, the easiest-to-use databases are designed for single-user applications. Under carefully controlled conditions, a single-user database can be used in a network environment.

Consider, for example, using a database to maintain a record of available computer software in the software library, where one of the criteria for the selection of the database software system is that it be an easy-to-use system. If you accept the premise, which would be appropriate in this instance, that only one person, the software librarian, would update the database, and that all other access would be "read only," there should be no problem. Use Netware security to provide only Read and Open access to the data file for general users, and restrict Create, Write, and Erase access to the software librarian.

Restricting update ability to a single user is not a viable option in many situations. As a result, multi-user database systems have been developed specifically to address the

The fundamental problem with allowing multiple users access to a database occurs when two users attempt to modify data at the same time.

needs of multiple users to simultaneously update the same data files.

Multi-user Database Systems

Multi-user database systems work with a system of software locks. When one user is performing an update, the system provides a lock to prevent another user from interfering with the update operation. In general, databases can be locked at three levels: the file level, the record level, and the field level. Locks can also be designated as *exclusive* or as *shared*. An exclusive lock means that all other users are excluded from the locked information. A shared lock means that although other users are prevented from changing the locked information that they may still view it. The flexibility of the software locking procedures is one of the differentiating features of multi-user databases.

With file locking, when one user accesses a database file, the system prevents other users from performing an update operation on the file. File locking is the most primitive and restrictive form of simultaneous access management. File locking is typically overkill for performing basic record updates, but is appropriate for operations such as sorting a file.

Record locking provides a finer level of control over database updates. In the previous example of Mark's payment and address change, a system with record locks would provide the following scenario: When Customer Service initiates an update on Mark's record, the system places a "lock" on the record. When Accounts Receivable attempts to post Mark's payment, they are denied update access to his record because of the pending

update. They are forced to wait to update Mark's payment until Customer Service posts the address change. Once Customer Service completes their update, the record lock is released and Accounts Receivable may proceed with their update activities. Record locking is the most sophisticated form of multi-access control in many multi-user database systems.

Field locks provide the most sophisticated and flexible locks available. By locking individual fields, only update operations that would actually conflict are prevented. In a system that supports field locks, when Customer Service initiates the address change, the database program locks

preserving the address update posted by Customer Service.

Because it is difficult to implement, field locking is not a common feature in today's database products. However, field locking provides the maximum utilization capability for shared data. None of the traditional market leaders in PC-based database systems, including dBase, Omnis Quartz, Foxbase, and Paradox, currently support field locking. Generally, the products that support field locking have a multi-user heritage, including products such as MDBS III, LAN Progress, Unify, and Team Up.

Locking is implemented either explicitly (manually) or implicitly (automatically). When developing applications in a database system that supports only explicit locks, such as dBase III, the database programmer must manually issue the appropriate Lock command to prevent a concurrent update to the

There is more than one method to address the problem of simultaneous updates, and these methods are one of the major differences between single-user databases and multi-user databases. The sophistication of the methods available to prevent simultaneous updating of information is one of the criteria used in selecting one database system over another for network applications.

only the address and telephone fields. (Customer Service has no business changing the dollar amounts in the Receivables or Payables fields anyhow.) When Accounts Receivable initiates their update of the Receivables field, the request is honored, and a lock is placed on the payment field. When Customer Service completes their update, only the locked fields are changed in Mark's record, and the address and telephone fields are unlocked. When Accounts Receivable completes their update, only the locked receivables field is updated,

information. With a database system that supports implicit locks, such as dBase IV, the database applications developer is freed from the need to manually lock and unlock the information, resulting in reduced time to develop stable applications.

Database Servers

For certain types of database applications, a database server is an excellent alternative to a traditional multi-user database system. To understand the advantage, it is neces-

sary to compare the strategies used by both traditional databases and a database server to process a user request.

In a traditional networked database system, the database program itself executes on the user's workstation. The network operating system provides the equivalent of a big hard disk drive. Consider a database request such as listing sales for Texas. A typical request posed in dBase might be issued as

LIST FOR STATE = 'TX'

When the database program, running on the user's workstation, receives this request, it begins systematic analysis of the database. It requests the first record from the sales database from the file server. The file server transmits the record back to the workstation. The workstation looks at the "state" field and determines that it is not Texas. The workstation then requests the second record from the sales database. The file server sends back the record to the workstation, which then determines whether the state is Texas and then either prints or doesn't print the record. To complete the task, the workstation sends a request for each database record, which the file server then sends back to the workstation.

A database server is a special piece of software that either executes on the file server, along with the network operating system, or on a separate computer on the network designated as the database server computer. In effect, a database server provides the mechanism for using more than one CPU to address a database operation. The database server implements a concept known as client-server computing.

The user's workstation, instead of executing the code necessary to both communicate with the user and extract information from data files, only executes the portion of the program for the user interface to the underlying SQL system. A worksta-

tion acting as a front end for a database server should require less memory and less CPU power for equivalent performance when compared to an equivalent system residing entirely on the workstation. The front end translates the information into SQL and sends the database server the instruction "send me all the database records for the state of Texas."

The database server software is the other half of the software system. The server scans all of the records in the database, sending only the Texas records to the workstation. A database server greatly reduces the required network traffic for process-

ing such a request. Assuming that the database program itself is stored on the server, by comparison, only half of the program is transferred across the network for execution by the workstation. The workstation sends a single request to the database server, instead of sending a request for every record in the database. The database server sends back across the network only those records that meet the search criteria. Additionally, the database server handles all of the file and record locking communications internally, providing an additional reduction in network traffic over a traditional database system. §



Dialing for Data

By Eric Lipscomb, Assistant Network Manager, School of Community Services (BITNET: LIPS@UNTVAX) and Kurt Grutzmacher, Microcomputer Support Consultant (BITNET: GRUTZ@UNTVAX)

With the advent of the information age, the amount of information available has grown to such an extent that it is now almost impossible to maintain direct access to everything you might need to know. Knowing where to find information is now as important as, if not more important than, having the information. Computer users with modems and empty telephone lines have a great link into the information world.

Most modem users will start out by calling a computer-based bulletin board system (known as a BBS) in their local area. Most of these systems offer message areas where users can carry on conversations by leaving notes to one another. There are also (in most cases) information files and programs that the users can download to their own PC to use. The selection tends to be limited, and the type of files and programs generally cover a broad spectrum.

On the national scale, services such as GENie, Compuserve, and the Source are well known for their vast interconnectivity with a large number of systems and users. These services are costly (online service fees plus telephone charges, if any) and may be intimidating to a new user or a modem novice. But the files and discussions on these systems are more detailed than those found on local BBS systems due to the large number of people who use them.

But there are other, lesser-known services available to modem users at no charge (excepting long-distance charges) that are dedicated to specific areas of interest. One subset of these systems is available from the US government. Many departments in the government run BBSs that provide vast quantities of information relating to their field, ranging from computer standards information to weather and time information, to information about crude oil. The remainder of this article will highlight a few of these systems.

The US Naval Observatory provides, as one of its many services, time information for the nation. By calling into their system, you can obtain data such as: the time of sunrise, sunset, twilight, moonrise, and satellite transits from a given

location; the direction and distance between any two points on the earth; the Universal time. The number for the service is (202)652-1079, modem settings: 1200 baud, even parity, 7 data bits. Voice information about the system is available at (202)653-1525.

The National Weather Service provides a BBS which callers can get information on climate conditions around the world as temperature, precipitation, weather indexes, heating and cooling days, and crop conditions. The information is gathered from over 8000 stations worldwide. The system number is (301)899-1214. Modem settings are 2400 baud, 8 data bits, no parity. To get information about the system, type NWS (after connect), then enter TEMPPASS at the password prompt. All information must be entered in caps.

The Institute of Computer Science and Technology, a division of the Institute of Standards and Technology (formerly the National Bureau of Standards) offers a number of BBS lines with computer-related topics. For all numbers listed below, use these modem settings: 1200 baud, 8 data bits, no parity. The systems available are:

- Database Management Information Exchange (301)948-2048 (301)948-2059
- Open Systems Interconnection BBS (301)869-8630
- Computer Performance and Evaluation Groups (301)948-5717
- MicroComputer Electronic Information Exchange (301)948-5718
- National Integrated Service Digital Network (301)869-7281

For additional information concerning the IST BBS systems, contact Ramona at (301)975-3587, and she will send you a packet describing the services offered.

On a closing thought, the Department of Energy supports a Crude Oil Analysis Database, the world's largest collection of data about crude oil physical properties, distillation and refining. Callers can get information on oil gravity, sulphur content, nitrogen content, viscosity, color, and pour point. Other information includes oil's geochemistry, its source, and financial value. The database is accessible at (918)336-3621. Modem settings 2400 baud, 8 data bits, and no parity. §

Changes From dBASE III Plus to dBASE IV for PC's

By Marilyn Rice, Microcomputer Support Consultant

Remember trying to use dBASE III Plus without any or some basic knowledge of databases, only to become confused and discouraged? The enhancements from dBASE III Plus to dBASE IV now provide power for a first-time user as well as application developers. The following discussion highlights many of the basic differences between dBASE III Plus and dBASE IV general working environment.

New User Interface

A completely new interface allows you to harness dBASE IV's features and power without needing to write statements at the dot prompt.

The dBASE III Plus *Assistant* has been replaced by the far more sophisticated *Control Center*, which makes it easier to work with all the essential database components. dBASE IV has easy to understand instructions and can simply create pull down menus.

The Control Center

The Control Center is your base of operations, the gateway to every other part of the dBASE IV program allowing you to open and close files, and access the menu system to establish views, reach design screens, run programs and manage files and other catalogs.

The Control Center is comprised of four main parts: A Menu Bar, Catalog Name, Control Center panels, and a Message and Navigation Line.

Holy Earthquake Batman, Watch Out for Those Disk Drives!

Beware of disk drives purchased from Bay Area suppliers during the coming year. It seems that hard disks are not designed for magnitude seven earthquakes like the one that occurred in Northern California October 17, 1989. You should thoroughly test suspected drives upon delivery to avoid future problems. §

A completely new interface allows you to harness dBASE IV's features and power without needing to write statements at the dot prompt.

The Menu Bar is located at the top left-hand corner. The Menu Bar has three pull down menus: **Catalog**, **Tools**, and **Exit**. When opened, the menus provide a rich array of data handling capabilities.

Directly under the Menu Bar in the center of the screen is the Catalog name. Catalogs allow the organization of files together in task-related groups. The Catalog name tells which catalog file group you are working with.

Located in the middle of the screen are the Control panels that display the six types of files: **Data**, **Queries**, **Forms**, **Reports**, **Labels**, and **Applications programs**.

At the bottom of the Control Center, the Navigation Line and the Message Line show available keyboard options for working with the files and data.

The Control Center also has some features not available from the dot prompt, such as a tree-structured DOS file directory and manager. dBASE IV also now honors the DOS read-only file attributes.

Database Files

Changes to database files make dBASE IV more powerful and efficient than dBASE III Plus. The database structures have been increased to contain up to 255 fields per record. In addition, each field may now optionally be designated as a key field on which the database is indexed.

dBASE IV database structures may also contain a new numeric data type, **F**, that indicates a field containing floating point numbers.

In addition to the above changes, a single file can now be related to more than one file simultaneously. For ex-

ample, a database file can be related to a query file and a report file at the same time, known as multiple-child, multiple-file relationships.

Browse and Edit

In dBASE IV, the Browse and Edit screens have been linked together to be used from the **F2 DATA** key to toggle between a table (Browse) and form (Edit) displays of information.

Again, for each screen, easy to use and understand pull down menus are available. Also, dBASE IV has a more powerful editor than dBASE III Plus for editing memo fields and programs. In addition, memo fields can now contain up to 64K of text.

in the middle of the screen with a menu bar.

You will then see at the bottom of the Help menu box, several menu options available for increased functionality. The options are:

- **CONTENTS:** Provides a nested Table of Contents of help topics.
- **RELATED TOPICS:** Displays a list of relevant help screens for various related topics.
- **BACKUP:** Allows backing up one screen at a time through selected help screens.
- **PRINT:** Prints the displayed Help screen directly to a printer.

Queries and Views

In dBASE IV, you create view queries on a new work surface, the query design screen which you can reach from the Control Center by selecting **<create>** in the Query panel. You can also select a data file and press **Shift-F2**.

Changes to database files makes dBASE IV more powerful and efficient than dBASE III Plus

Error Handling

This error handling feature has been greatly improved from dBASE III Plus to dBASE IV. When an error occurs at the dot prompt, you may now select options to edit the command line, get help, or cancel the command.

Help System

The Help system is far more powerful than before. dBASE IV has an on-line, context-sensitive help feature you can activate any time.

To get to the Help menu, Press the **F1** Help key and a Help box appears

You can now join files, filter their records and choose which fields to display using the "file skeleton" (blocks representing database fields) onto the query design screen. You can also create calculated fields and global filters for any query.

Forms

The screen painter has been greatly improved. You can lay down all the fields and field names at once with an automatic layout. You can assign colors to design elements or draw crisp lines and boxes around your forms.

You will also find it easier to move fields, boxes and copy text to other places on the form. Calculated fields are available and you have more picture and template characters to choose from.

Labels

You no longer have to enter dBASE expressions for each line of the label. Instead, labels use a layout surface and you place fields where you want them to appear on a label.

Fields can be added from the database file or query view. The labels generator offers support of an automatic setup for nine of the most common label sizes.

Reports

The Reports layout surface has been completely redesigned. You now use a WYSIWYG (What You See Is What You Get) layout screen that is divided into several report bands. Each band represents either a specific grouping of records, or a special band such as a report introduction or summary.

Indexing

dBASE IV uses a new method of indexing that is able to maintain up to 47 index tags in a single file called an .mdx (multiple index) file. Each index tag is similar to an old .ndx file, and consists of a tag name and key expression. The basic difference is that up to 47 different index expressions (the equivalent of 47 old .ndx files) can be maintained in a single .mdx file.

You can create the index using the pull down menus or, if preferred, at the dot prompt. For example, consider a customer database in which you needed three different indexes. In dBASE III PLUS, you would create the indexes from the dot prompt as follows:

```
USE Customer
INDEX ON Cust_nbr TO
Custnbr
```

```
INDEX ON SUBSTR(Last_
name,1,8)+SUBSTR(First_
name,1,1) TO Custname
```

```
INDEX ON Zip_code+SUB-
STR(Last_name,1,8) TO Custzip
```

Using the production .mdx file in dBASE IV, you would need the following similar commands:

```
USE Customer
INDEX ON Cust_nbr TAG
Custnbr
INDEX ON SUBSTR(Last_
name,1,8)+SUBSTR(First_na
me,1,1) TAG Custname
INDEX ON Zip_code+SUB-
STR(Last_name,1,8) TAG
Custzip
```

Also, dBASE IV maintains complete compatibility with dBASE III PLUS .ndx files. and dBASE IV allows up to 10 of any kind of index files (.mdx or .ndx) plus the production .mdx files to be open simultaneously per database file.

New Commands and Functions

For the experienced dBASE applications user, dBASE IV has many new commands and functions that make it far more efficient and powerful to use than any previous versions of dBASE. The following list doesn't cover all the functions, just an overview. For a complete listing of commands and functions, consult your dBASE IV Language Reference Manual.

The enhanced functions are:

- BOF()
- CHANGE()
- DBF()
- DELETED()
- EOF()
- FIELD()
- FLOCK()
- FOUND()
- ISMARKED()
- KEY()
- LOCK()
- LOOKUP()
- LUPDATE()
- MDX()
- NDX()
- RECCOUNT()
- RECNO()
- RECSIZE()
- RLOCK()
- SEEK()
- TAG()

The enhanced commands are:

- DISPLAY STRUCTURE
- SKIP
- GO/GOTO
- UNLOCK
- LIST STRUCTURE
- USE
- RESET

In addition to these commands, dBASE IV has added commands and functions for calculating financial, mathematical and statistical information. The CALCULATE command can process and evaluate any of these functions in a single pass throughout the database. For example:

In dBASE III PLUS:

```
USE customer
COUNT TO Nbr_Custs
SUM Total_Dol TO Amt_Spent
```

Now is used in dBASE IV:

```
USE customer
CALCULATE CNT(), SUM
(Total_Dol) TO Nbr_Custs,
Amt_Spent
```

See the Language Reference Manual for full information on the financial and statistical capabilities of the CALCULATE command.

For handling financial functions, dBASE IV has a few functions added to make it easier to calculate future values, present values, payments and other financial information.

The financial functions are:

- FV()
- PAYMENT()
- PV()

To compute complex calculations, several mathematical and trigonometric functions have been added to dBASE IV.

The new mathematical and trigonometric functions are:

- SIN()
- ASIN()
- COS()
- ACOS()
- TAN()
- ATAN()
- ATN2()
- PI()
- RTOD()
- DTOR()
- SIGN()
- CEILING()
- FLOOR()
- LOG10()
- RAND()

Statistical capability has been added to dBASE IV with the ability to easily calculate standard deviations, variances, minimums, maximums, averages, sums and counts of database records in one pass through the CALCULATE command.

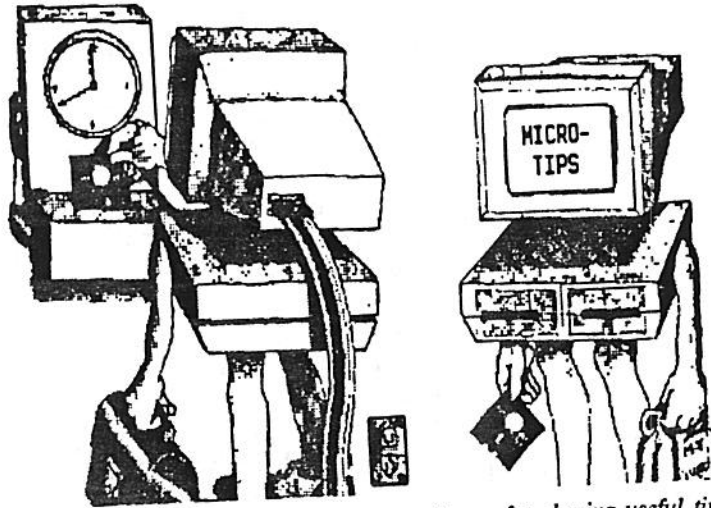
Again, please consult the section in the Language Reference Manual for more information on all the above functions, as these are just an overview of what is available.

Summary

As you can see, dBASE IV has changed considerably from dBASE III PLUS. On the other hand, almost all dBASE III Plus applications will run under dBASE IV without modification. For additional information about dBASE IV, please contact the MicroComputer Support Team at 565-2316 or 565-2319. Also, classes on dBASE IV are held for faculty and staff during the semesters, please look for the class schedule in the Personnel News Bulletin.

References

- Ashton-Tate Corporation, "dBASE IV Change Summary" September 1988.
- Rice, Marilyn, "Introduction to dBASE IV" Computing Center Short Course handout, February 1990.
- Ashton-Tate and the Ashton-Tate logo, dBASE, dBASE III PLUS, and dBASE IV are trademarks of Ashton-Tate Corporation. §



This column is intended to serve as a forum for sharing useful tips on making more productive use of microcomputers. If you have a tip that you feel may be of use to campus users, submit it to the Benchmarks editor for possible inclusion in a future issue.

Establishing Meaningful Relationships

By Kyle Capps, Manager of Microcomputer Support

Dbase III Plus and Dbase IV are relational database management systems, but many people do not understand the significance of the word "relational" and even fewer people have actually used this very powerful feature of Dbase. Relations are established links between different open databases that allow for the movement of multiple record pointers in child databases depending on the movement of the record pointer in the parent database. The active database is referred to as the "parent" and the database that is linked by a relating expression referred to as the "child". The invoicing model illustrated below explores the significance of establishing relationships between databases.

Problem :

You have been selected by your supervisor to create a database that will be used to store invoicing information for your department that will permit the printing of invoices at a later date. Your objective is to create the database structure that will allow for the entry of the invoice information.

Most individuals would create a single database designed from whatever hard copy information was available as illustrated from the sample invoice information provided below.

Typical information contained on a single Invoice

- Company Name and Address
- Invoice Date
- Invoice Number
- Customer Billing Name and Address

- Customer Shipping Name and Address
- Customer Purchase Order Number
- Terms of Sale (C.O.D., Net 10, Net 30, etc.)
- Salesperson
- Shipper (UPS, FedEx, etc.)
- Ship Date
- Quantity Purchased

- Inventory Number
- Inventory Description
- Unit Price
- Extended Price
- Subtotal Amount
- Shipping Charges
- Tax
- Total Invoice Amount

As stated previously, most individuals would use the information

provided above to create the database structure as illustrated in the table below.

The poor individual that would have to enter invoices into this database would soon have some rather choice words to describe its creator. If you try to enter any invoices into this database, you will find several serious flaws with the database design which we will explore in more detail on the following page.

FILENAME : INVOICE.DBF

Field	Field Name	Type	Width	Dec
1	COMP_NAME	Character	30	
2	COMP_ADDR1	Character	30	
3	COMP_ADDR2	Character	30	
4	COMP_CITY	Character	25	
5	COMP_STATE	Character	2	
6	COMP_ZIP	Character	10	
7	COMP_PHONE	Character	12	
8	INVOICE_NO	Numeric	8	0
9	INV_DATE	Date	8	
10	BILL_NAME	Character	30	
11	BILL_ADDR1	Character	30	
12	BILL_ADDR2	Character	30	
13	BILL_CITY	Character	25	
14	BILL_STATE	Character	2	
15	BILL_ZIP	Character	10	
16	BILL_PHONE	Character	12	
17	SHIP_NAME	Character	30	
18	SHIP_ADDR1	Character	30	
19	SHIP_ADDR2	Character	30	
20	SHIP_CITY	Character	25	
21	SHIP_STATE	Character	2	
22	SHIP_ZIP	Character	10	
23	SHIP_PHONE	Character	12	
24	CUST_PO_NO	Numeric	8	0
25	TERMS	Character	15	
26	SALESMAN	Character	25	
27	SHIPPER	Character	15	
28	SHIP_DATE	Date	8	
29	QTY	Numeric	8	0
30	ITEM_NO	Character	8	
31	ITEM_DESC	Character	30	
32	UNIT_PRIC	Numeric	8	2
33	EXT_PRICE	Numeric	8	2
34	SUBTOTAL	Numeric	10	2
35	SHIP_CHG	Numeric	8	2
36	TAX	Numeric	8	2
37	TOTAL	Numeric	8	2

Design Flaws

- **Calculated fields are part of the database structure** – Fields that are based on calculations of other fields should not be defined as elements of the database since the calculations can be performed on the time the invoice is printed. This would eliminate the fields: EXT_PRICE, SUB-TOTAL, and TOTAL.
- **Only one individual item per database record** – If you can visualize an invoice, you will know that an invoice can contain several different items purchased on the same invoice. The structure listed above would only allow one individual invoice item per database record. This would have the effect of the operator entering the company and customer information for every item on the invoice. Then you get the brilliant idea of adding more fields to increase the number of individual items per database record, such as QTY1, QTY2, QTY3, and so on. Think again, this would waste a lot of disk space for the invoices that only had one or two items.
- **Company and customer information entered for each invoice** – The company and customer information must be entered for each invoice every time an invoice is entered. This has the effect of creating a lot of data entry for the operator and possible errors in the typing of company and customer information. I wonder how an owner would react if they saw the company name misspelled on a company invoice?

A Better Design

We have determined that the above structure is not the acceptable way to create an invoicing database. By using a relational model, we can design an efficient and effective sys-

tem by creating several databases instead of a single one. To illustrate the relational design, we will create multiple databases to store the required information as shown below:

File Name : INVMaster.DBF Indexed on INVOICE_NO

This database would contain one master record to reflect a single invoice entered into the system. You can think of this database containing only the information found at the top half of an invoice.

Field	Field Name	Type	Width	Dec
1	INVOICE_NO	Numeric	8	0
2	INV_DATE	Date	8	
3	CUST_CODE	Character	8	
4	CUST_PO_NO	Numeric	8	0
5	SALESMAN	Character	25	
6	SHIP_CODE	Character	8	
7	SHIP_DATE	Date	8	
8	COMP_CODE	Character	8	
9	PRINT_SW	Character	1	

File Name : INVITEM.DBF Indexed on INVOICE_NO

This database would contain one record for each individual item on the invoice. The INVMaster.DBF and INVITEM.DBF databases will be linked by establishing a relationship between the two databases based on the invoice number field, INVOICE_NO.

Field	Field Name	Type	Width	Dec
1	INVOICE_NO	Numeric	8	0
2	ITEM_CODE	Character	8	
3	QTY	Numeric	8	0

As you examine the above example database structure, you will notice that the company, customer, shipping, and inventory information is missing from the databases and the fields COMP_CODE, CUST_CODE, SHIP_CODE, and ITEM_CODE have been added to the structure. Keep in mind that you are trying to design the most efficient system and typing the company, customer, and inventory information for each invoice is certainly not efficient. By now you may have figured out that you need the four additional databases that are shown below.

File Name : CUSTOMER.DBF Indexed on CUST_CODE

This database would contain one record for each customer that would be invoiced. This permits the entry of the customer information only once, thereby greatly reducing errors during invoicing. The databases CUSTOMER and INVMaster would be linked by establishing a relationship based on the field CUST_CODE, as seen on the following page.

Field	Field Name	Type	Width	Dec
1	CUST_CODE	Character	8	
2	BILL_NAME	Character	30	
3	BILL_ADDR1	Character	30	
4	BILL_ADDR2	Character	30	
5	BILL_CITY	Character	25	
6	BILL_STATE	Character	2	
7	BILL_ZIP	Character	10	
8	BILL_PHONE	Character	12	
9	SHIP_NAME	Character	30	
10	SHIP_ADDR1	Character	30	
11	SHIP_ADDR2	Character	30	
12	SHIP_CITY	Character	25	
13	SHIP_STATE	Character	2	
14	SHIP_ZIP	Character	10	
15	SHIP_PHONE	Character	12	
16	CONTACT	Character	25	
17	TERMS	Character	15	
18	CURR_BAL	Numeric	10	2
19	OVER30_BAL	Numeric	10	2
20	OVER60_BAL	Numeric	10	2
21	OVER90_BAL	Numeric	10	2
22	PREF_SHIP	Character	8	
23	TAX_RATE	Numeric	5	2
24	TAX_ID_NO	Character	15	

File Name : COMPANY.DBF Indexed on COMP_CODE

This database would usually only contain records indicating information for one company, but it is feasible to have multiple company names. An accounting firm that processes invoices for several clients, all from the same software system, would be an example of such an instance. The databases COMPANY and INVMASER would be linked by establishing a relationship based on the field COMP_CODE.

Field	Field Name	Type	Width	Dec
1	COMP_CODE	Character	8	
2	COMP_NAME	Character	30	
3	COMP_ADDR1	Character	30	
4	COMP_ADDR2	Character	30	
5	COMP_CITY	Character	25	
6	COMP_STATE	Character	2	
7	COMP_ZIP	Character	10	
8	COMP_PHONE	Character	12	
9	SHIP_ADDR1	Character	30	
10	SHIP_ADDR2	Character	30	
11	SHIP_CITY	Character	25	
12	SHIP_STATE	Character	2	
13	SHIP_ZIP	Character	10	
14	SHIP_PHONE	Character	12	

Continued on Page 30.

Educational Software BBS Offered by Addison-Wesley

Reprinted from Turn-Around Times, Winter 1990, University of California at Davis. Originally printed in the October 1989 issue of C3 News, a publication of the Center for Academic Computing at Pennsylvania State University.

Addison-Wesley has started a bulletin board system (BBS) to allow users 24-hour access to a wide variety of information and services. The Educational Software Bulletin Board System allows users to share templates and files for the Student Edition of Lotus 1-2-3, datasets for Minitab, and problem sets for MathCAD or MICRO-CAP II, among other programs. Users may also use this BBS to ask technical support questions, to receive product information to send and receive electronic mail, to register software licenses, to receive updates, and to access public domain software.

To access the Addison-Wesley BBS, call (617) 942-1580. You can call in at 300, 1200, or 2400 Baud with your modem set at 8 bits, no parity, and 1 stop bit. To upload or download files, you can use any communications program which supports Xmodem, Ymodem, Zmodem, or Kermit file transfer protocols. The BBS operates 24 hours a day.\$

Bitstream Fontware Now Available for WordPerfect 5.1

According to an article in the April 1990 *WPCorp Report*, Bitstream Fontware for WP 5.1 can be obtained by calling (800) 222-9409 or sending a check for \$29.95 to:

WordPerfect Corporation
Bitstream Orders
1555 N. Technology Way
Orem, UT 84507\$

File Name : SHIPPER.DBF Indexed on SHIP_CODE

This database would contain the shipping vendors information such as UPS, Federal Express, etc. This database is necessary to calculate shipping charges for a particular invoice since shippers have different shipping charges based on weight. The databases SHIPPER and INVMASTER would be linked by establishing a relationship based on the field SHIP_CODE.

Field	Field Name	Type	Width	Dec
1	SHIP_CODE	Character	8	
2	SHIP_NAME	Character	30	
3	SHIP_ADDR1	Character	30	
4	SHIP_ADDR2	Character	30	
5	SHIP_CITY	Character	25	
6	SHIP_STATE	Character	2	
7	SHIP_ZIP	Character	10	
8	SHIP_PHONE	Character	12	
9	CONTACT	Character	25	
10	WEIGHT_CHG	Numeric	6	2

File Name : PRODUCT.DBF Indexed ITEM_CODE

This database would contain all of the inventory information for the business including descriptions, quantity on hand, price, and weight. The databases PRODUCT.DBF and INVITEM.DBF would be linked by establishing a relationship based on the field ITEM_CODE.

Field	Field Name	Type	Width	Dec
1	ITEM_CODE	Character	8	
2	ITEM_DESC	Character	30	
3	ITEM_QTY	Numeric	8	
4	UNIT_PRICE	Numeric	8	2
5	VENDOR	Character	30	
6	QTY_ON_ORD	Numeric	8	
7	QTY_ON_BKO	Numeric	8	
8	WEIGHT	Numeric	6	2
9	UNIT_MEAS	Character	4	
10	REORD_PNT	Numeric	6	
11	LOCATION	Character	10	

You will notice that several new fields have been added to the database structures listed above. Proper database design dictates that a lot of thought should be given to including all information useful to the application.

Bringing it All Together

This is as far as we are going with in this MICRO-TIP for now. Next time, we will "bring it all together," into a program that will print invoices from the invoice master database. §



The second quarterly Apple Seed meeting took place April 24 at Baylor University. The topic of discussion was Host Connectivity. The next Apple Seed seminar will be in Dallas on July 24. The topic of discussion will be Developer Tools. For more information and a registration form, contact:

Apple Seed Headquarters
Attn: Jennifer Hayes
12770 Merit Drive
Dallas, Texas 75251 §

Trojan Alert!

According to an article in the March 1990 issue of *Campus Computing*, a publication of The University of British Columbia, a serious trojan has surfaced in England. Dubbed the "twelve tricks," after the number of methods it uses to create problems on your computer, it is received as an executable program file. Once the program is run, it replaces the partition record (also known as the Master Boot Record, or MBR) on your hard disk. After this, your computer seems to be suffering from a variety of problems which disappear upon rebooting, only to be replaced by different problems. The FAT also gets progressively corrupted.

The offending program has been identified as a corrupted version of CORE-TEST, Version 2.6, but the trojan may have been placed in other legitimate programs as well. It appears to escape detection by anti-virus programs, but can be identified by inspecting the hard disk at cylinder 0, head 0, sector 1. The following text will be visible (although the company listed does not seem to be involved): SOFTLOK+ V3.0 SOFTGUARD SYSTEMS INC. §

VAX COMPUTER CLUSTER

BEST OF THE BBS

Edited by Mark Thacker,
VAXProgrammer/
Operator (BITNET:
MARK@UNTVAX)



VAXCLUSTER USAGE STATISTICS

February Top Ten Programs: CPU Time Used

Program	Description	CPU Time	Percent of Total
1. User programs	Compiled Programs	18 11:10:01.16	56.6
2. NEWS	ANU News Utility	1 23:51:26.54	6.1
3. LISP	Lisp Interpreter	1 18:45:36.00	5.5
4. EDT	Editor	1 02:50:55.86	3.4
5. BACKUP	Disk Backups	0 23:28:52.62	3.0
6. PASCAL	Pascal Compiler	0 16:29:44.95	2.1
7. MAIL	VMS Mail	0 16:18:08.77	2.1
8. TPU	TPU Editor	0 14:29:01.67	1.9
9. NNTP TCPWIN	News Transfer Utility	0 14:10:58.74	1.8
10. LOGINOUT	User login	0 13:28:32.53	1.7
Total		32 14:51:46.37	

Welcome to the *Best of the BBS* column. This column highlights some of the more interesting and useful discussions on the UNT BBS. For those of you not familiar with the BBS, here is how to log into the UNT BBS.

- Sign-on by typing CALL DEC at the LAN prompt and then entering BBS as your Username at the VAX prompt.
- If you are already logged-on to the VAXcluster, type BBS at the \$ prompt.

The opinions expressed in this column do not necessarily reflect the views of Academic Computing Services or the Computing Center. Also, information in *Best of the BBS* has not been checked for accuracy.

Downloading from the BBS

#37586 4-MAR-1990 10:14:24.83

Subject : Downloading files

Helppppppppp!!!!!! I have MTE communications software, and I want to download files from the

Continued on page 32.

February Top Ten Programs: Frequency of Runs

Program	Description	Number of Runs	Percent of Total
1. LOGINOUT	User login	73164	17.7
2. SET	VMS Utility	57943	14.1
3. DIRECTORY	VMS Utility	34230	8.3
4. User programs	Compiled Programs	28429	6.9
5. DELETE	VMS Utility	27092	6.6
6. EDT	Editor	22760	5.5
7. SEND	Bitnet Message Utility	19368	4.7
8. SYSLOGIN	User Login	17758	4.3
9. TYPE	VMS Utility	14590	3.5
10. PASCAL	Pascal Compiler	11347	2.8
Total		412300	

March Top Ten Programs: CPU Time Used

Program	Description	CPU Time	Percent of Total
1. User programs	Compiled Programs	40 25:56:31.61	84.2
2. NEWS	ANU News Utility	1 05:48:52.06	2.6
3. EDT	Editor	0 12:37:34.75	1.1
4. LISP	Lisp Interpreter	0 10:11:20.86	0.9
5. MAIL	VMS Mail	0 08:44:25.57	0.7
6. BACKUP	Disk Backups	0 08:21:38.45	0.7
7. BBS	Bulletin Board	0 07:52:19.05	0.7
8. PASCAL	PASCAL Compiler	0 07:51:41.16	0.7
9. TPU	TPU Editor	0 07:28:10.45	0.6
10. LOGINOUT	User login	0 07:15:24.80	0.6
Total		48 16:16:59.24	

BBS, but I am having trouble with it. The BBS wants me to receive within Kermit, but I don't have the program. How can I download files from my program?

#37591 Reply to #37586 4-MAR-1990 11:21:28.20

Subject: RE: Downloading files

Simple: You can't. At least, until you get something like ProComm or Kermit, both of which UNT does provide, free of charge. Just bring by a formatted disk to the ISB building, room 110.

Information about Kermit downloading is available on the BBS in the Bulletins section.

Expanded vs Extended Memory

#37863 7-MAR-1990 02:21:57.59

Subject: 1Meg

I have a Packard Bell 286 with a 40meg hard drive and a 5 1/4" floppy drive. I recently upgraded my ram from 640k to 1 meg and now I have been getting an OUT OF MEMORY error messages on some of my programs. I didn't need a memory expansion card and I changed the jumper so it would recognize the meg. I had to split my memory from the setup program to 512 on board and 512 expanded memory. When I start up the system it says I have 1024 ready to use. How can I fix this so I can run these programs without the message. Also I tried to boot the system from the A: drive so I can deactivate the resident memory and still I get the problem. Any help in this matter would greatly be appreciated.

#37893 Reply to #37863 7-MAR-1990 12:56:13.93

The great world of MS-DOS won't let you access that extra 512k unless you set it up as EXPANDED memory... Right now, it's what's known as EXTENDED memory - and unless the programs you are running

March Top Ten Programs: Frequency of Runs

Program	Description	Number of Runs	Percent of Total
1. LOGINOUT	User login	65587	15.9
2. SET	VMS Utility	56056	13.6
3. User programs	Compiled Programs	35737	8.7
4. DIRECTORY	VMS Utility	32672	7.9
5. DELETE	VMS Utility	28925	7.0
6. EDT	Editor	19844	4.8
7. SEND	BITNET Message Utility	18695	4.5
8. SYSLOGIN	User Login	15759	3.8
9. TYPE	VMS Utility	15111	3.7
10. PASCAL	Pascal Compiler	11756	2.9
Total		411255	



VAX System News

The following upgrades will be made at the end of the semester, check NEWS on the VAX for more information:

- May 11 - Netware VMS 2.13
- May 14 - VMS 5.3-1 - the Vaxcluster will be down most of the day.
- May 15 - WIN/TCP 5.1 - Internet access will be down in the morning. The VAX will be rebooted at least once.
- May 14-16 - Minitab, Pascal, COBOL, ADA, C, and FORTRAN will be upgraded as time permits. §

check for EXTENDED, you're only going to be giving them less than 512k to use (since DOS takes up some memory as do any drivers that you may be running.)

Try, if you can, partitioning your memory to 640k normal and 384k extended. Then, with a driver, you can make that 384k Expanded memory, and usable. §

COMPUTING TECHNICAL SERVICES

Mainframe Performance Statistics

Operating Systems Performance Statistics for February

CPU	SYSTEM	Planned Production Hours	Production Hours Achieved	System Uptime
ACAD	VM/SP5	672.00	628.29	93.5%
ACAD	MUSIC/SP	638.99	587.01	91.7%
ACAD	MVS/JES2	672.00	596.78	88.8%
ACAD	COMPLETA	662.31	585.63	88.4%
ADMN	MVS/JES2	672.00	664.83	98.9%
ADMN	COMPLETA	249.00	241.22	96.9%
ADMN	ADABASA	647.28	639.56	98.8%

Operating Systems Performance Statistics for March

CPU	SYSTEM	Planned Production Hours	Production Hours Achieved	System Uptime
ACAD	VM/SP5	744.00	739.15	99.3%
ACAD	MUSIC/SP	711.81	706.75	99.3%
ACAD	MVS/JES2	744.00	736.76	99.0%
ACAD	COMPLETA	730.90	723.24	99.0%
ADMN	MVS/JES2	744.00	741.55	99.7%
ADMN	COMPLETA	354.00	351.85	99.4%
ADMN	ADABASA	723.49	692.99	95.8%

Key Causes Of Lost Productivity In March: ACAD CPU

CPU, Tape, and Disk Subsystems (HDS)

1. Research and analysis of incompatibility problem with MVS/SP running under VM/SP5 in dual-processing mode on the 8083. 3.80 HOURS

Miscellaneous

1. Systems software development. 3.86 HOURS
- GRAND TOTAL 7.66 HOURS

Key Causes Of Lost Productivity In February: ACAD CPU

CPU, Tape, and Disk Subsystems (HDS)

1. Reconfiguration of Main Storage in HDS 8083 to resolve MVS/SP incompatibility in MP Mode. 3.29 HOURS
 2. Upgrade of microcode in HDS 8083 to resolve dual-processing incompatibility. 1.60
- TOTAL 4.89 HOURS

Miscellaneous

1. Resolve MVS/SP incompatibility running under VM/SP in dual-processing mode. 40.50 HOURS
 2. Resolve VM/SP5 incompatibility with HDS 8083 in dual-processing mode. 21.14
 3. Emergency shutdowns due to partial failure of outside TRANE chilled water condenser units. 6.58
 4. Emergency shutdown due to extended power failure in GAB 560. 1.90
 5. Resolve VM/SP5 filled SPOOL Queue. 1.57
- TOTAL 71.69 HOURS

GRAND TOTAL 76.58 HOURS

Key Causes Of Lost Productivity In February: ADMN CPU

Miscellaneous

- | | |
|---|-------------------|
| 1. Emergency shutdowns due to partial failure of outside TRANE chilled water condenser units. | 5.95 HOURS |
| 2. Emergency shutdown due to extended power failure in GAB 560. | 1.75 |
| 3. Systems software development. | 0.87 |
| TOTAL | 8.57 HOURS |

Key Causes Of Lost Productivity In March: ADMN CPU

Miscellaneous

- | | |
|--------------------------------------|--------------------|
| 1. DASD file maintenance on ADABAS. | 26.86 HOURS |
| 2. Resolve filled MVS message queue. | 1.75 |
| 3. Systems software development. | 1.56 |
| TOTAL | 30.67 HOURS |

- The ACAD CPU achieved 100% uptime in February and March.
- The HDS/7360 DASD achieved 100% uptime in February and March.
- The HDS/7380 DASD achieved 100% uptime in February and March.
- The ADMN CPU achieved 100% uptime in February and March.
- The HDS/7360 DASD achieved 100% uptime in February and March.
- The HDS/7380 DASD achieved 100% uptime in February and March.
- The EMC Solid State Disk achieved 98.1% uptime in February and March.

Disk Backup Schedules

SYSTEM	BACKUP	DESCRIPTION
Administrative MVS/SP	Daily	Monday - Friday around 7 p.m. (after COM-LETE is shut down) & on Saturday & Sunday if COM-LETE has been up that day.
	Weekly	Full pack dumps taken each Sunday morning.
	Monthly	Full pack dumps taken on the first day of each month.
Academic MVS/SP	Daily	Monday - Sunday during the early hours of the morning.
	Weekly	Full pack dumps taken each Sunday.
	Monthly	Full volume dumps taken on the first day of each month.
MUSIC/SP	Daily	Wednesday - Monday starting at 4 a.m. and lasting about 30 minutes.
	Weekly	Tuesday mornings at 3 a.m., these last about 2 hours.
	Semester	Once a semester, a permanent backup is taken.
VM/SP	VM Weekly	Early every Wednesday morning.
	CMS mini-disks	Daily backup performed early every morning. Weekly backup every Wednesday starting at 3 a.m..
VAXcluster	Daily	Incremental backups are performed Monday - Thursday at 6 p.m.
	Weekly	Full backups are performed every Friday beginning at 8 a.m. and generally last all day.
	Monthly	A "stand alone" backup is performed monthly. Dates and times are given in the system log-on message.
	Semester	Once a semester, a permanent backup is taken.

A full description of the system backup procedures can be found by typing **HELP BACKUP** on MUSIC/SP or the VAXcluster.

ACADemic (HDS) Program Hit Parade

February Top Ten Programs : Frequency Of Runs

Program	Description	#of Runs	% of Total
1. IEWL	Linkage Editor	11416	17.2
2. PGM=*DD	Compiled Program	11223	16.9
3. IKFCBL00	VS COBOL Compiler	8328	12.6
4. IEBGENER	IBM Utility	6087	9.2
5. SASLPA	SAS	4734	7.1
6. ADARUN	ADABAS Utility Module	3896	5.9
7. SPSSX	SPSS-X	3405	5.1
8. IEBPTPCH	IBM List Utility	3091	4.7
9. ADASQLC	ADABAS SQL Compiler	2653	4.0
10. IGYCRCTL	VS COBOL2 Compiler	1808	2.7

February Top Ten Programs: CPU Seconds Used

Program	Description	CPU Seconds	% of Total
1. SASLPA	SAS	111137	44.8
2. PGM=*DD	Compiled Program	50884	20.5
3. COMPLET4	Academic COM-LETE	21338	8.6
4. SPSSX	SPSS-X	17843	7.2
5. IKFCBL00	VS COBOL Compiler	10249	4.1
6. ADARUN	ADABAS Utility Module	9928	4.0
7. IEWL	Linkage Editor	3529	1.4
8. IGYCRCTL	VS COBOL2 Compiler	3037	1.2
9. SSS4001	Operations Automation	2812	1.1
10. ISTINM01	VTAM Utility	2372	1.0

March Top Ten Programs : Frequency Of Runs

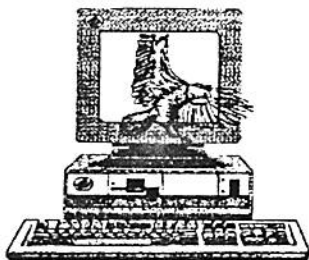
Program	Description	#of Runs	% of Total
1. IEWL	Linkage Editor	11001	16.8
2. PGM=*DD	Compiled Program	10711	16.4
3. IEBGENER	IBM Utility	8482	13.0
4. SASLPA	SAS	5674	8.7
5. IKFCBL00	VS COBOL Compiler	5250	8.0
6. IGYCRCTL	VS COBOL2 Compiler	4669	7.1
7. IEBPTPCH	IBM List Utility	3436	5.2
8. SPSSX	SPSS-X	3380	5.2
9. IEFBR14	IBM Null Utility	2410	3.7
10. CASMA001	Sort Utility	1938	3.0

March Top Ten Programs: CPU Seconds Used

Program	Description	CPU Seconds	% of Total
1. SASLPA	SAS	152468	46.4
2. PGM=*DD	Compiled Program	50220	15.3
3. COMPLET4	Academic COM-LETE	42265	12.9
4. SPSSX	SPSS-X	16989	5.2
5. IGYCRCTL	VS COBOL2 Compiler	10232	3.1
6. ADARUN	ADABAS Utility Module	9857	3.0
7. IKFCBL00	VS COBOL Compiler	6715	2.0
8. SSS4001	Operations Automation	6355	1.9
9. IEWL	Linkage Editor	6190	1.9
10. SPCHLCOB	COBOL2 Report Writer	3913	1.3

The programs listed in this section were used the most frequently on the HDS ACADemic CPU during the months of February and March, 1990.

Please Note that ACAD is the official designation of the HDS/8083 CPU that is dedicated to faculty and student use. The HDS/8083 CPU reserved for University administrative purposes is termed ADMN.\$



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Special Benchmarks Supplement:

The Hidden Brain Damage Scale

Reprinted from funny@looking.on.ca. Submitted by jon@bodedo.ucm.org (Jon Boede). The preface to the scale states: "Of the many psychometric devices designed to measure the dimensions of human variation, the Hidden Brain Damage Scale stands alone as the only instrument capable of predicting a preference for pimento loaf. For this reason, and despite the sizable revenues that might accrue from the copyright, we offer the scale here for public consumption. It was authored in a flurry of graduate school insight some years ago by Robin Vallacher (Illinois Institute of Technology), Christopher Gilbert (private practice, New Jersey) and Daniel Wegner (Trinity University, San Antonio, Texas). Although a true-false format is recommended, we have found that many test-takers opt for the response of getting tangled up in the drapery.

1. People tell me one thing one day and out the other.
2. I can't unclasp my hands.
3. I can wear my shirts as pants.
4. I feel as much like I did yesterday as I do today.
5. I always lick the fronts of postage stamps.
6. I often mistake my hands for food.
7. I'd rather eat soap than little stones.
8. I never liked room temperature.
9. I line my pockets with hot cheese.
10. My throat is closer than it seems.
11. I can smell my nose hairs.
12. I'm being followed by a pair of boxer shorts.
13. Most things are better eaten than forgotten.
14. Likes and dislikes are among my favorites.
15. Pudding without raisins is no pudding at all.
16. My patio is covered with killer frost.
17. I've lost all sensation in my shirt.
18. I try to swallow at least three times a day.
19. My best friend is a social worker.
20. I've always known when to close my eyes.
21. My squirrels don't know where I am tonight.
22. Little can be said for Luxembourg.
23. No napkin is sanitary enough for me.
24. I walk this way because I have to.
25. Walls impede my progress.
26. I can't find my marmots.
27. There's only one thing for me.
28. My uncle is as stupid as paste.
29. I can pet animals by the mouthful.
30. My toes are numbered.
31. Man's reach should exceed his overbite.
32. People tell me when I'm deaf.
33. My beaver won't go near the water.
34. I can find my ears, but I have to look.
35. I'd rather go to work than sit outside.
36. Armenians are comical in full battle dress.
37. I don't like any of my loved ones.

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